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Editorial Notes

After the B.I.F.

FRIDAY last saw the end of the fortnight's run of the British Industries Fair. It was a grand display, and the Gas Industry lent strength and distinction to the Section at Castle Bromwich. Whatever may be said about the wisdom or otherwise of the Gas Industry participating in the Fair, the Industry this year made a really magnificent display. If next year's Fair sees no Gas Section it will lose a wealth of colour, but, when the enormous cost to the plant and appliance makers is taken into account, it is clear that sentiment cannot be allowed to influence policy. It may not be without a tinge of regret that the Industry says good-bye to Castle Bromwich, but the decision at least will not have been made without the most careful consideration of what is in its best interest.

We think we are right in saying that at this year's Fair there was an atmosphere of friendliness more pronounced than ever before between supplier of gas and manufacturer of gas making, distributing, and consuming equipment. This is as it should be. Certainly we have never heard more wholehearted praise of the manufacturers' efforts from the Industry's personnel. To them the outstanding display in the Gas Section was a source of pride and a source of increased confidence in the future of gas. It brought out in marked degree the courage and the enterprise of the manufacturers of gas producing and consuming plant and appliances. It showed what organization and co-ordination can achieve; it was a fine example of the merits of co-operative policy. It must have dispelled any feeling of pessimism as to the future progress and prosperity of the Industry. In troubled times, it was a brave, an optimistic, and a characteristically British display. The manufacturers have played their part in a wholly admirable way.

While there can be no question about all this, it savours to a large extent of preaching to the converted, and at a very high cost. Business pulling power and prestige value *vis-à-vis* the unconverted are always hard to estimate, but it is these which must be chiefly kept in mind in considering future policy. From this point of view it is highly satisfactory to realize that the Gas Industry has learnt the art of display and that at exhibitions on a large scale it unquestionably knows how to tell its story. And what a wide and varied story it has to tell of its innumerable services in home and in industry. The Gas Section was a rich and arresting display of gas appliances of clean design, sound production, and superlative finish. Those within the Industry who follow its progress day by day cannot help but take many things for granted. We would, however, be interested to see—were this possible—the reaction to the 1939 Fair of any gas engineer who visited the first Gas Section of the Fair in 1928 and who from that year till this was completely out of touch with the Industry. He would be amazed at the changes and developments made in the last decade, amazed at the extent of the new potentialities of the Industry brought about by skilful experiment and imaginative thinking.

If we are to say good-bye to the Gas Section we can at any rate look back with pride on the 1939 display of a great British Industry more united, more capable, and younger in spirit than ever before.

Holding Companies

As mentioned in the "JOURNAL" last week, Lord Onslow, Chairman of Committees in the House of Lords, is to propose to the House on March 14 the appointment of a Select Committee to investigate the effect of the acquisition by holding companies of statutory gas, water, and electricity undertakings. The idea is to discover whether control by holding companies can impair the efficiency of the undertakings' existing provisions regulating the raising of capital, the borrowing of money, the charges to be made, or the relation between dividends and prices charged—to find out whether modifications are needed in legislation.

We do not propose at this stage to embark on a dissertation on the merits or otherwise of the holding company movement as applied to the Gas Industry. That it has been the means of improving gas service in many directions is clear for all to see, and we claim that improvement in gas service is definitely a national service. Whatever may have been the motives of those who began the movement and those who have given it such acceleration in recent years, there

can be no possible suggestion that among them was any idea of evading any of the safeguards provided by legislation for the regulation of the Industry. In fact, the Industry itself as a whole is so jealous of its own reputation that any subversive move of the kind would be quickly exposed, and would have little prospect of succeeding.

While, therefore, the Industry has nothing to fear, and might even welcome such an investigation at the proper time, the matter is not by any means urgent, and it seems pertinent to ask why Parliament should be burdened with it at the present juncture, when mind and sinew are being concentrated on vital problems of national defence. This is a detached view of the matter. From the Gas Industry's own viewpoint, it can be remarked that it, too, is deeply concerned with A.R.P., and is fully occupied with perfecting the protection against possible attack of one of the nation's vital services. Nor has the incidence of the Coal Selling Schemes lightened the tasks of the Industry. It has become necessary to sacrifice much time in hearings before Committees of Investigation, as the pages of the "JOURNAL" testify. The complaint of Gas Consolidation and the Cannock District Gas Company met with a satisfactory solution—an outcome which demonstrates the need for putting forward legitimate claims, whatever the effort involved. In another case, that of the Newcastle Company, it has been found necessary to carry the matter further, and the Company is appealing to the Appeal Tribunal against the decision of the Committee of Investigation. The first stage in the hearing of this appeal is reported on later pages of this issue of the "JOURNAL." In view of such circumstances the Gas Industry cannot be disposed to welcome with open arms the proposal of Lord Onslow.

We hope that due consideration will be given, when Lord Onslow's motion comes before the House, to these few points. It is well known that, as far as gas is concerned, the greatest care has been taken to avoid the need for any such enquiry. If, however, one is deemed to be necessary, this is no opportune time to involve the Industry in the enormous amount of extra work which such enquiries entail.

Wages and Sickness

THE case of Marrison and Bell, in which the Court of Appeal reversed the decision of the Sheffield County Court, has decided an issue with regard to which considerable doubt has been felt by employers of labour. Briefly, the question at stake was whether a workman who is incapacitated from performing his duties owing to temporary sickness is entitled to wages, notwithstanding the fact that during that period of sickness he is receiving benefits under the National Health Insurance. Many employers had no doubt considered that the contributions made by them under the National Health Insurance were in effect a premium paid in respect of an insurance against their having to pay wages during sickness.

This in substance appears to have been the view of the County Court Judge. His decision, however, was reversed by the Court of Appeal, in which Lord Justice Scott in his judgment stated that the benefits received under the National Health Insurance were intended to be additional benefits for the purpose of improving the worker's financial position during sickness. The benefits were "in their nature irrespective of the amount of wages as determined by the workman's individual contract of service." Whether the worker is entitled to receive wages either in whole or in part during sickness in addition to National Health Insurance would depend upon his contract of service. Some such contracts may provide expressly that no wages or only a part of the normal wages are payable during sickness. In other cases it may be a general custom of a particular trade that wages are not paid during sickness, and such a general custom might be regarded as having been impliedly incorporated in the contract of service. It is to be noticed, however, that temporary sickness does not in itself terminate a contract of service, although it would always be open to the employer to do so by giving a due and proper notice to the worker.

Some surprise has been caused by the decision, on the ground that in former cases it has been decided that wages cannot be claimed in addition to compensation payable under the Workmen's Compensation Act. The explanation lies in the difference between that Act and the National Health Insurance Act, 1936. Compensation under the Workmen's Compensation Act is based upon the wages received, and where it is granted by the Courts the effect is to place a liability upon the employer to pay some part of an injured worker's wages as compensation. The employer is thereby deprived of the right which normally he could exercise of evading further responsibility by terminating the contract of service by due notice. Benefits under the National Health Insurance Scheme are not, however, related to wages, and are payable not by the employer but by the State. The two forms of payment are, therefore, not comparable.

The decision of the Court of Appeal is obviously one of importance, although it has merely declared what has long been considered by competent authorities to be the correct interpretation of the law. In practice, the question whether wages are payable when workers are in receipt of National Health Insurance benefit will depend upon the contract of service, and it is to that which it will be necessary to look in determining the question in individual cases.

"All-Gas" Home Heating

WELL-DESERVED success is attending the policy adopted by the Newcastle-upon-Tyne and Gateshead Gas Company of developing the use of gas for all domestic heating purposes, to the entire exclusion of solid fuel from the home. Tributes received from customers who have adopted "all-gas" heating show that a higher standard of comfort, much reduced housework, and added cleanliness are achieved at practically no greater cost to them. With such strong recommendations as these, there is every justification for the opinion expressed at the recent annual meeting of proprietors (as reported on p. 594 of last week's issue of the "JOURNAL") by the new Chairman of the Company, Sir Cecil A. Cochrane, that there ought to be a steady development of this load in the future.

Referring to the "new Chairman," we would express the wish (and the belief that it will be so) that Sir Cecil Cochrane may enjoy every success at the head of so enterprising an undertaking as that of the Newcastle Company. The points made by him in his first Address as Chairman are full of promise of a future fully comparable with the past—and what the past has been is to be gathered from his generous tribute to his predecessor in the Chair, Mr. John E. Cowen, in whom ability vied with a charming personality to make him an outstanding figure in the Gas Industry. If it is true, as undoubtedly it is true, that under Mr. Cowen's Chairmanship the Company was raised to a foremost position in the Industry, we feel equally assured that with Sir Cecil Cochrane at the head it will be kept there.

What spirited effort can accomplish was made manifest at the meeting. Progress all along the line, and orders in hand

which will represent an annual increase in gas consumption of more than 100 million cu.ft. It was not without hard work on the part of management and staff that the Chairman was enabled to say that "throughout the year the increasing regard for gas as a fuel has been noticeable, and . . . a rapid change-over to gas is taking place in all spheres of industrial heating, from the most highly exacting type of work to the most crude form of heat application."

Stimulating Consumption per Consumer

A PROBLEM of their own faces those gas undertakings whose areas of supply present no facilities for further development or extension, and this appears to be the position of the Hornsey Gas Company, who possess a strictly limited area. It is confined to the Parish of Hornsey, and does not cover even the whole of that parish, for part of it is supplied by the Gas Light and Coke Company. This being so, there is very little in the way of new building or fresh development upon which the Company can count in the future, and, as was explained to the proprietors by Mr. A. M. Paddon, when presiding at the annual meeting (see "JOURNAL," March 1, p. 597), the Company are thus forced to what may be called the intensive development of the use of gas by the multifarious implements which have been introduced day by day. They have to create new business with their consumers, "with much of which those consumers have not been familiar in the past, and to which it is the Company's duty to introduce them." In the Chairman's view this is probably expensive, but it does promise ability on the Company's part to maintain the output of gas, even though it should be impossible to increase it. Of course, enlarging the consumption per consumer in the way Mr. Paddon had in mind may cost money, but there is a saving of expenditure on new mains, &c., which is so frequently involved in undertaking entirely fresh business. Consideration of the matter from this aspect often makes increasing the consumption per consumer appear an attractive proposition from a Gas Company's point of view.

As the Chairman indicated, in the case of the Hornsey Company this policy has become essential, and there is no room for doubting that it will be pursued with vigour and success. The Company's area may be strictly limited, but it is in the care of a local authority endowed with considerable breadth of vision. This is evident from the fact that the Company have been able to restore the full former rate of dividend (which they had been compelled by certain circumstances temporarily to reduce in the first half-year); this course having been rendered possible by the obtaining of an increase in the standard price of gas, "for which," said Mr. Paddon, "they had reason to thank the Hornsey Borough Council, who had shown the Company great courtesy and consideration."

Ascending Costs in 1939

ADDRESSING the proprietors at the annual meeting of the Tottenham and District Gas Company, the Chairman, Mr. Henry Woodall, essayed to disperse any trifling confusion of thought which may have existed in the minds of some people regarding the small increases that so many companies have found themselves compelled to make in the price of gas. For reasons which are well known—and should be even better understood than they are—an increase in the price of gas, in these days of keen and growing competition, is the very last thing to commend itself to the directors and officials of gas companies, so long as the fair claims of the stockholders do not demand it—and even to the stockholders it frequently entails the sacrifice of some fraction of their dividend. As will be seen from the report of the meeting which appears elsewhere in this number of the "JOURNAL," Mr. Woodall pointed out that the increase in the price of gas which his Company have felt themselves compelled to impose is "to meet the very serious rise in the price of coal which came into operation, so far as the Tottenham Company are concerned, on Jan. 1 this year." The effect of the increase in gas price will be that the 67,000 consumers by ordinary meters in Tottenham will have to pay a little over ¼d. a day extra, and the 116,000 prepayment consumers a little under ¼d. a day. Remarking, with regard to coal, that "prices are artificially high on account of the advantage taken by the coal industry of legislation, Mr. Woodall went on to say: "There may be some consolation in the belief that prices have reached their peak, and that, when we enter the market for our next year's requirements, we may find conditions a little easier."

So far as the Tottenham Company's own business is concerned, the outlook is bright. Gas is now supplied over a large and steadily developing area of nearly 450 square miles. The amalgamation with the Southgate Company is regarded as certain to prove to the advantage of all concerned. In addition, the Tottenham Company have purchased all the shares in the little St. Margaret's Gas Company (which adjoins their own area), and have closed down the works; and, further, they control the Dunstable Gas and Water Company. All of which are included in the 450 square miles already mentioned. Then there is another point. The Company now enjoy the advantages of a basic price for gas—a system introduced by the late Dr. Charles Carpenter, and as Mr. Woodall remarked, "one of the many things for which the Gas Industry remembers and thanks him."

More and More Consumers

TAKING a flight to the South Coast, we find similar reports of steady progress in the matter of numbers of consumers supplied, figures with regard to which were given at the annual meetings of the Bournemouth Gas and Water Company and of the Southampton Gaslight and Coke Company, as published on pp. 591 and 595, respectively, of last week's issue of the "JOURNAL."

Mr. William Cash, addressing the stockholders of the Bournemouth Company said they had added during the year practically 4,000 new gas consumers, bringing the total number up to close upon 78,000. Over 38 miles of new gas mains were laid, including a trunk main to Wareham and the districts *en route*. This brings the total main mileage up to 674. It should be mentioned that the Wareham and Brockenhurst gas undertakings have been purchased. These two concerns were taken over as from July last, and already the consumers in those areas have expressed their gratification at the improved services rendered and the cheaper supply. In spite of the unfavourable conditions, sales of gas are up by 1¼% on the year, and at less than 9d. per therm (after the small increase that has been reluctantly decided upon), the further use of gas should be encouraged. In connexion with this addition to the price, Mr. Cash pointed out that up to now the Company have been benefiting from coal contracts fixed some time ago. In 1939 they will feel the full effect of the additional cost of coal; while, on the

other hand, "coke, tar, and other residuals are difficult to estimate, so far as the price they will bring in is concerned." Actually the increase in the price of gas is equivalent to only 5%, whereas the cost of coal is rising by 15%.

The increase during 1938 in the number of consumers at Southampton was nearly 2,300, bringing the total very close to the 77,000 mark. There has, too, been an increase in sales of gas of 95 million cu.ft., or 4½%, which follows upon an increase in 1937 of slightly over 3%. There also falls to be recorded an increase in the Winchester area of 11¼ million cu.ft., or almost 5½%. Addressing the proprietors, the Chairman, Sir Russell Bencraft, said that the price of coal for the year was 9d. per ton more than before—and, of course, considerably more had to be carbonized to provide the large additional quantity of gas required. Thus the increase in the cost of coal for 1938 amounted to upwards of £9,000. On the other side of the account, the return from residuals advanced to the extent of just about one-half the increase in the cost of coal; and of this one-half, again just about one-half was due to the new benzole plant at Winchester, which was started-up in January of last year. Coal will cost still more this year, but it is not anticipated that it will be necessary to raise the price of gas, unless unforeseen circumstances should arise. Altogether a satisfactory record, and a promising outlook, which it must have given Sir Russell Bencraft great pleasure to portray.

Officers as Directors

It has at all times been an extreme pleasure to be able to record in the "JOURNAL" the fact that the valuable and loyal service—and, be it added, the special knowledge acquired over a long period of administration—of a particular official of a gas company has been rewarded by election to a seat on the Board of his undertaking. And this pleasure has been two-fold. In the first place, the bestowal of a Directorship in those circumstances appeals to us as being a pre-eminently suitable "award of merit;" secondly, we are pleased because we feel it to be in the best interests of the Gas Industry generally, as well as of the undertaking directly concerned, that companies should in this way avail themselves of the undoubted benefit of long and intimate experience of the working of their undertakings just where it can be made the utmost use of.

At the moment, the subject has been brought to mind again by the intimation that Mr. W. A. King, who has held responsible positions in the Canterbury Gas and Water Company for 36 years—for the first 11 years as Chief Clerk and Accountant, and for the last 25 years as Secretary—having retired from the latter position, "the Directors felt that his valuable services should be in some way retained for the Company," and so they would propose him as an additional Director. We congratulate Mr. King—and we congratulate the Company. But we would add that our argument in favour of "Officers as Directors" does not necessarily apply only upon retirement from active service.

"Ladders"

A lady, contributing to the correspondence page of a popular illustrated daily, asks if those responsible for conducting the "Live Letter Box" which is featured by this contemporary (the *Daily Mirror*) can do anything to remedy her complaint that the height at which slot meters are fixed renders them awkward to get at. She says that the "ladders" she has made in her stockings through trying to reach her slot meter would be enough to "stock a decorating firm." It is added, perhaps a little unkindly, that "the meters which are just there for the man to read quarterly are placed all nice and comfortably on the floor." Has this correspondent overlooked that the Gas Company's collector must scale the heights to reach the slot meter in order to clear it; or has she borne in mind the fact that he would have no stockings to "ladder"? In any case, it would seem to have escaped her notice that in all probability "there is a reason" for placing the slot meters in a position where they are less conspicuous and convenient than they would be if placed "nice and comfortably on the floor." After all, there are worse experiences than a "ladder" in the stocking.

Tell the Public

There can be no doubt that if electricity were to replace gas in the heating field to any considerable extent the price of current would soar. A widely extended use of electricity for heating would also mean the improper use of the nation's fuel resources. These facts have been stated in an impressive and convincing manner both by Sir David Milne-Watson and by Mr. E. V. Evans, and they cannot be too widely known. All channels should be employed to bring them before the public, and company meetings provide one very useful channel. We are glad, therefore, to note that at the general meeting of the Reading Gas Company, Mr. D. H. Helps took the opportunity to quote both Sir David and Mr. Evans. The contribution of the Gas Industry to the national welfare merits far wider recognition, and the personnel of the Industry should do all possible to bring about this recognition. The position between the two industries, gas and electricity, is too confused. The public is already suffering from a degree of overlapping and competitive effort. National economy and the consumers' pockets are best served if the demands for heat are met by the products of the Gas Industry, gas and coke.

Forthcoming Engagements

March

9.—B.C.G.A.—Annual Meeting of Members in Eastern District at Cambridge.
9.—I.G.E.—Ad Hoc Joint Committee on Research, 11.15 a.m.
9.—Midland Association.—Spring General Meeting. Presidential Address of G. C. Pearson.
10.—L.C.C.A. (Distributors' Branch).—Central Committee, Gas Industry House, 2.30 p.m.
11.—Scottish (Western) Juniors.—Visit to Dixon's Coke Ovens, Govan Hill, Glasgow.
13.—I.G.E.—Finance Committee, 1.45 p.m.; Membership Committee, 2.15 p.m.; General Purposes Committee, 3 p.m.
13.—L.C.C.A.—Finance Committee, 10.45 a.m.; Executive Committee, 11.15 a.m.; Central Committee, 2.30 p.m.
13.—Scottish (Eastern) Juniors.—Visit to Newbattle Colliery of the Lothian Coal Company, Ltd.
14.—I.G.E.—Council Meeting, 10 a.m.; Special General Meeting, for the Presentation and Discussion of a Paper on "The Deterioration of Coal on Storage," by James Jamieson and W. J. Skilling, 6 p.m.
14.—London and Southern Juniors.—Paper by L. F. Randall, "The Servicing of Gas Apparatus."
15.—B.C.G.A.—Scottish Conference at Saltcoats.
15.—I.G.E.—Board of Examiners, 10.30 a.m.; Domestic Heating Committee, 2.30 p.m.
15.—London and Counties Coke Salesmen's Circle.—Meeting at Gas Industry House, 2.30 p.m. Paper by G. Dougill, "Coke from the Production Side."
15.—N.G.C.—Central Executive Board, 2.30 p.m.
15-16.—B.C.G.A.—District Conference at Bedford.
16.—I.G.E.—Refractory Materials Joint Committee, 2.30 p.m.
16.—Midland Juniors.—Visit to Staveley Coal and Iron Company, Ltd., Chesterfield.
17.—B.G.F.—Joint Exhibition Committee, 3.30 p.m.
17.—Southern Association (Western District).—Commercial Meeting, Rougemont Hotel, Exeter, 2.30 p.m.
18.—Wales and Monmouthshire Juniors.—Meeting at Pontypridd. Paper by K. Muir.
18.—Western Juniors.—Meeting at Exeter. Visit to Works of Willey & Co., Ltd. Paper by F. A. Rhead.
18.—Yorkshire Juniors.—Meeting at Bradford. Paper by R. Anderson, "Gas-Fired Heating Installations at Bradford."
21.—B.C.G.A.—Annual Meeting of Members in Manchester District, to be held at Manchester, 2.15 p.m.
21.—I.G.E.—Gas Education Executive Committee, 2.30 p.m.
24.—Southern Association.—Annual General Meeting, Hotel Victoria, W.C. 2, 2.30 p.m. Presidential Address of F. Blackburn.
25.—Scottish (Western) Juniors.—Annual Business Meeting, Christian Institute, Bothwell Street, Glasgow. Address by W. McL. Dick.
28.—S.B.G.I.—Council Meeting, 2.30 p.m.
29.—Southern Association (Eastern District).—Meeting at Gas Industry House, 2.30 p.m. Discussion on "Fuel Economy in Gas-Works."
30.—Midland Juniors.—Paper by H. G. Broadbridge, "Recent Developments in Control of Continuous Vertical Retorts."

Personal

A complimentary supper to Mr. J. E. BLUNDELL, Carlisle Corporation's Gas Engineer and Manager, who retires at the end of this month, was given by Mr. R. C. Chance, Chairman of the Gas Committee, on Feb. 27. As a tribute to Mr. Blundell, who has been highly esteemed during his twenty years' official connexion with the City, the Mayor, Members of the Gas Committee, the chief Corporation officials, and the staff and workmen of the Gas Department attended. During the evening presentations were made to Mr. Blundell, on behalf of the chief officials and by the staff and workmen serving under him. The company numbered about 150.

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At the annual dinner of the Canterbury Gas and Water Company Sports and Social Club a gold wristlet watch was presented to Mr. W. A. KING, who recently retired from the position of Secretary after thirty-six years' service.

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Mr. STANLEY J. L. ROBINSON has been appointed Chairman of Midland Tar Distillers, Ltd., and Mr. RICHARD BURT ROBINSON Vice-Chairman.

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Mr. ROBERT POOLE, who has been General Manager of Richmonds Gas Stove Company, Ltd. (Radiation Ltd.), has been appointed a Managing Director. Mr. MAURICE H. THORNTON, a Director of the Company, has been appointed General Manager. Mr. W. DONALD KING, Sales Manager, has been appointed Director.

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Mr. H. WILDE is resigning the position of Sales Manager of the Hornsey Gas Company, which he has held since 1933, to become Branch Manager for Ascot Gas Water Heaters in Manchester, and he takes up his duties early this month. During his stay at Hornsey, Mr. Wilde has been Chairman of the North London Salesmen's Circle and he was awarded the Goodenough Silver Medal for 1936. Before going to London, Mr. Wilde was with the Bradford Gas Department.

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The marriage was solemnized on March 7, at St. Augustine's Church, Edgbaston, Birmingham, of Mr. ERNEST ASTBURY, Chief Engineer to the Liverpool Gas Company, and Miss Elsie Beryl Astbury, daughter of the late Canon Astbury, of Smethwick. The Rev. H. Stanley Astbury, M.C., M.A., Principal of Chester College, brother of the bride, officiated.

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The Liverpool Electric Power and Lighting Committee has appointed Mr. P. C. HILL Official Inspector of Gas Meters. He previously held a similar position at Middlesbrough.

Obituary

Percival William Flavel

We regret to announce the sudden death in London on Tuesday of last week of Mr. PERCIVAL WILLIAM FLAVEL, J.P., Chairman and Managing Director of Sidney Flavel & Co., Ltd., of Leamington and London. Mr. Percival Flavel was the great-great grandson of John Flavel, who founded the firm in 1754. His father, Sidney Flavel, Jun., converted the concern into a limited liability company in 1902. Mr. Percival Flavel became a Director of the Company in 1911, Managing Director in 1916, and Chairman in 1931.

News of the Week

Authority to Prepare plans and estimates for an additional gasholder has been given to the Engineer and Manager of the Rhyl Gas Department, Mr O. P. Cronshaw, by the Urban District Council.

A Special Course in Domestic Science has been arranged at the Halifax Gas Department's central showrooms by the head demonstrator, Miss Whitehead. This is mainly intended for newly-married women, brides-to-be, housekeepers, and maids. The classes are expected to extend over ten weeks, one class per week.

The Next Meeting of the Members of the Fuel Luncheon Club will take place at the Connaught Rooms, Great Queen Street, Kingsway, W.C. 2, on Thursday, March 16, at 12.40 for 1.10 p.m., when the after-luncheon Address on "The Structure of the Coal Industry in Various Countries" will be given by Professor P. O. Rosin, Dr.Ing. The Chair will be taken by Lt.-Col. W. A. Bristow (Vice-President).

Birthday Greetings to "20th Century"—the Magazine of British Cellophane, Ltd. We agree with the Editor, Mr. Harold Mayer, that the first year of any magazine is perhaps the most critical in its history, for during those twelve months it has to justify its very existence. "20th Century" is a sturdy youngster and has gone through its first year with flying colours. It has given proof that it is *alive*. That it continues to be so is clear from the contents of the current issue. The publishers are the Publicity Bureau of British Cellophane, Ltd., 17-19, Stratford Place, Oxford Street, W. 1.

Full Advantage was Taken of the B.C.G.A. Film Publicity Programme at Stockton-on-Tees on Feb. 28. Members of several of the Townswomen's Guilds were invited to an afternoon showing of the films in the Corporation Gas Department's showrooms, and in the evening a display was given in a local hall. In both cases attendances were excellent and the films much appreciated. Modern gas appliances were exhibited at both shows and the interest taken at the close of each showing gave great encouragement for future publicity on similar lines. This is the first time the films have been shown in Stockton-on-Tees, and Mr. F. L. Scaife, Engineer and Manager, informs us it is intended to follow up this publicity in the near future by booking a larger hall and showing the films for a longer period.

A Motion to Increase Gas Charges by 3d. per 1,000 cu.ft. was referred back for further consideration in committee by the Birkenhead Town Council last Wednesday.

Mr. T. R. Cook, Engineer and Manager of the Blackpool Corporation Gas Department, addressed the educational circle of the Young Liberals' Association last week on "Coal and its By-Products."

Due Chiefly to Increased Coal Costs, the Warrington Gas Committee has recommended to the Town Council that the price of gas in the town shall be increased by 6d. per 1,000 cu.ft. from the end of the March quarter.

An Increase in the Price of Gas has been approved by the Burnley Town Council to meet the considerably increased costs of production. To continue without an increase for another year would have entailed a loss estimated at £15,000.

The Demolition of a Large Holder in the Grimshaw district has been decided upon by the Blackburn Gas Committee. The holder was constructed many years ago, and rather than spend £2,000 on re-sheeting, the Committee have decided to sell it as scrap.

A Scheme for Improved Public Lighting has been approved by the Airdrie Town Council. New lamps and alterations will cost £1,923 and extra gas £735. The improvements are to be carried out at the beginning of next lighting season and the cost is to be spread over a period of two years.

A Series of Demonstrations was given by the Coatbridge Gas Company, in co-operation with Coatbridge Co-operative Society, on March 2, 3, and 4, in the Lesser Town Hall, Mr. David Lambie, Assistant Engineer and Manager, and Mr. W. F. Anderson, Secretary, being in attendance.

Messrs. Keith Blackman, Ltd., announce that on and after Monday, March 13, their Head Offices and London Works will be at Mill Mead Road, Tottenham, London, N. 17. Telephone—Tottenham 4522 (12 lines) and telegrams "Keithblac Phone London." New offices and works have been erected on a 10½-acre site in close proximity to Tottenham Hale Station on the L.N.E.R. New manufacturing plant, of the latest design has been installed, and this in conjunction with the vastly increased production facilities afforded by the new works will enable the firm to cope more successfully with the ever-increasing demand for their specialities.

The King Visits Gas Section of the B.I.F.

During his visit to the British Industries Fair at Birmingham on Wednesday the King spent some time in the Gas Section.

At the stand of Radiation Ltd., Mr. J. F. Davis (Deputy-Chairman) was presented to His Majesty and told him that the largest gas range in Great Britain stood before him and that it could provide a banquet for 2,000 people at a running cost of ¼d. per person. The King said: "I hope that the chefs in hospitals and hotels all over the country will appreciate the advances that have been made in modern cooking methods. These ranges are extremely efficient to-day." The manner in which the range is operated was explained by the Chef, Mr. Edward Wells, who among his other accomplishments speaks five languages. He was assisted by Miss Zita Fitzgerald, a cookery demonstrator. At another part of the stand the King saw a full course banquet which had been prepared on the spot.

[Photo. by courtesy of British Movietone News

His Majesty on the Radiation Stand.

At the stand of the British Gas Federation a number of presentations were made, including Mr. R. Robertson, Col. O. B. F. Planck, Major F. J. Bywater, and Mr. A. W. Smith. The King signed the Visitors' Book and it was remarked that he had done this on a previous occasion as Duke of York. He noticed on the table and commented upon a silver replica of a gold cigarette case which was presented to him and to the Queen on the occasion of an earlier visit to the Fair in 1923. The case belongs to Mr. A. W. Smith.

His Majesty also stopped at the stand of Messrs. C. R. Averill, Ltd., where he was interested in the continuously flowing tap there exhibited—the water from which was apparently coming from nowhere. The King asked Mr. Averill to explain it, and His Majesty subsequently discovered that Mr. Averill was one of his Duchy of Cornwall tenants and chatted with him for some time.

Combustion Appliance Makers' Association (Solid Fuel)

Annual Luncheon and Conference

The Combustion Appliance Makers' Association (Solid Fuel) will hold its Annual Luncheon at the Dorchester Hotel, London, on March 29, and its Annual Conference at the Caxton Hall on March 29 and 30.

The General Council of the Association has appointed Mr. William Rennie, Chairman and Managing Director of Federated Foundries, Ltd., as President for the year 1939-40, to succeed Mr. J. Arthur Reavell, who has completed his second term of office.

The Annual Conference is open to all interested in the production, distribution, and use of fuels, and tickets may be obtained by application to the Secretary, 54, Victoria Street, London, S.W. 1.

Airdrie's New Works

Industrial Development

Following the recent plebiscite of ratepayers, the result of which was published in last week's "JOURNAL," the Airdrie Corporation have decided to retain the Gas Undertaking and to proceed with the erection of new plant. The tender of Messrs. West's Gas Improvement Company has been accepted for carbonizing plant.

It was intimated that prior to the plebiscite the Scottish Tar Distillers, Ltd., Falkirk, had made an offer for the undertaking.

Messrs. James Taylor (Wheatholm), Ltd., are to erect a gas-fired oven which will consume 1,500 cu.ft. of gas per hour, and it was agreed to offer the firm the supply on the basis of a guaranteed consumption of 4 million cu.ft. of gas per annum on the understanding that in the event of the annual consumption being less than that figure they should have the option of paying the difference between the actual consumption per annum at ordinary industrial rates. Messrs. Crimpy Crisps, Ltd., were granted permission to install an industrial meter at their new factory at Cairnhill Road, Airdrie, the Council agreeing that in the event of the consumption of gas over the ensuing three years not exceeding 2 million cu.ft. per annum, the firm should be asked to refund one-half of the cost of the meter. The Council further decided to give a supply of gas estimated at approximately 100,000 cu.ft. per month to the Scottish Motor Traction Company, Ltd. (Aircraft Section) on a sliding scale.

Middlesbrough to Continue Coke Oven Supply

Manufacturing Plant Not to be Constructed

The Middlesbrough Town Council has decided not to proceed with its £157,000 plan for the erection of plant to manufacture coal gas, and has decided to revert to the use of coke-oven gas. The bulk of the town's supply will come from the Cleveland Works of Messrs. Dorman Long & Co., Ltd., and will involve the laying of about five miles of mains. Tenders are to be obtained for this work.

Some time ago, it will be recalled, Messrs. Dorman Long closed down some of their coke-oven plants, which prevented the firm continuing its bulk supply to the Middlesbrough Corporation. The Corporation considered laying down its own plant, but under the new agreement with Dorman Long this will not now be necessary.

Amalgamation and Grouping

Huddersfield's Proposed Acquisition.

A Special Order under the Gas Undertakings Acts, 1920 to 1934, for which the Huddersfield Corporation Gas Department intend to apply to the Board of Trade provides for the transfer to the Corporation of the Gas Undertakings of the Holmfirth Urban District Council (including the Gas Undertaking which, prior to the coming into operation of the County of York West Riding Review Order, 1938, was vested in the Honley Urban District Council), the Holmfirth Gas Light Company, the Newmill Gas Light Company, Ltd., and the Netherthong Gas Company, Ltd.

Women's Gas Council

Conference for Domestic Science Teachers.

The Women's Gas Council are organizing a Conference for Domestic Science Teachers to be held at Berridge House, Fortune Green Road, Hampstead, from April 14-18 next.

An interesting programme has been arranged, commencing with a Reception and Dinner at Gas Industry House on April 14. On the following day Mr. R. N. LeFevre will speak on "Service Behind the Meter," while other items include "Planning and Equipping a Kitchen for School Use." "Balancing the Budget in School Catering," "The Homes of the Future," together with demonstrations and visits to the Radiation Research Kitchen and the Watson House Research Laboratories.

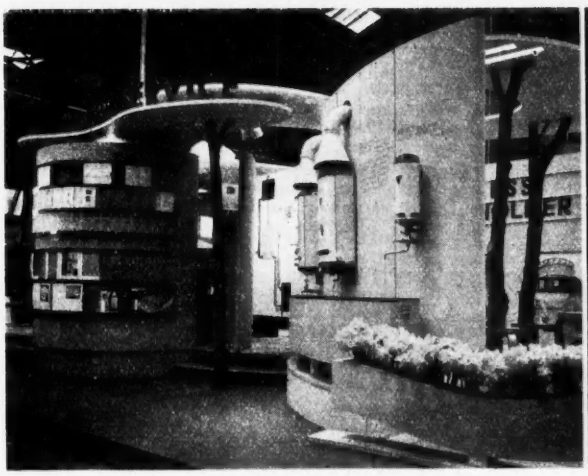
Alternative outings on the Sunday include Windsor, Hampton Court, or a coach tour of London. The inclusive fee for the Conference with all meals and accommodation at Berridge House is £2 10s. Application forms may be obtained from the Secretary of the W.G.C.

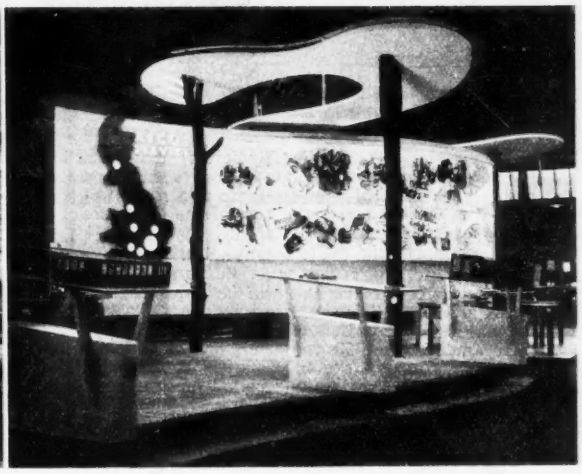
Stevenage Film Show

At a social afternoon the Stevenage Branch of the Women's Gas Council had a film show on the development of newspapers. The Vice-President, Mrs. Ireton, presided over an attendance of seventy, which included twenty visitors from Biggleswade.

Further Views from the B.I.F.

ON the Waterless Gasholder Company's stand, seen on the left, visitors were enabled to inspect constructional drawings and photographs, and to procure descriptive literature relating to this type of holder, which has achieved such pronounced success throughout the world. Associated with the Waterless Gasholder as Joint Exhibitors were the British Contractors, R. & J. Dempster, Ltd., Manchester; Robert Dempster & Sons, Ltd., Elland; Clayton, Son, & Co., Ltd., Leeds; and E. Cockey & Sons, Ltd., Frome, who have been severally responsible for the fabrication and erection of some forty-three "M.A.N." holders in Britain and twelve overseas.





THE Ascot Gas Water Heaters' stand, shown above, was designed to focus attention on production methods and the principles of service of the Ascot organization. The stand represented a raised tea-garden, providing both a restful atmosphere and a practical means of refreshment and demonstration. Shades of natural birch, grey, and pale rose enhanced the effect.

Facing the main gangway across the centre of the stand and in full view of the tea terrace was a striking photographic display showing the ramifications of the Ascot service by means of an illuminated map of the British Isles, clearly indicating Branch offices and the areas covered by them. The remainder was subdivided into two main sections under the headings "Technical" and "Sales."

At the back of the fin bearing the Service display was a compact section displaying most of the "Ascot" range of appliances in operation—a feature being the multi-point, claimed to be the first completely automatic heater embodying both gas and water volume governors. Special gauges connected to this appliance demonstrated that variations in the supplies had no effect upon the efficiency of operation. A full-size glass model of the multi-point was linked up with a light-actuated display showing how this appliance can be used in conjunction with a coke-fired boiler system to relieve it of all duty in the summer or supplement it in the winter.

The circular tea bar was equipped with two "Ascot" boiling water appliances by way of demonstrating the ease with which these can supply constant boiling water at a turn of the tap.

Scale models, on the steps of the terrace, showed the Ascot Works at Neasden with the new all-gas canteen and the instruction centre as convincing proof that no effort has been spared by this firm to improve the welfare of their workers and benefit the Industry as a whole.

Potterton's Sports Club Dinner

There were some 150 members and guests present at the Annual Dinner and Dance of Messrs. Thomas Potterton (Heating Engineers), Ltd., Sports and Social Club—known as the "Victor" Sports Club—held at Stanley Hall, Clapham Junction, S.W. 11, on Feb. 25. Mr. T. F. C. Potterton, Joint Managing Director of the firm and President of the Club, was in the chair, and among the guests were Mr. S. G. Moss (Auditor), Mr. T. W. Moore (Architect of the new works which the firm are building at Wandsworth) and his assistant, Mr. H. J. Urquhart, Mr. A. W. Willson (Messrs. W. Willson & Sons, the builders of the new works), and Mr. W. A. Lunn (Secretary of the Balham League).

The toast of "The Club" was proposed by Mr. W. A. Lunn, who made reference to the friendly relations which a Club such as this engendered between the members and their employers and the spirit of co-operation which resulted. Mr. F. Brooks (Chairman of the Club) responded and outlined the future activities of the Club. The ladies, visitors, and Press were welcomed by Mr. T. G. Brooks, who thanked them for their support. Mr. Willson responded and thanked Mr. Brooks for his remarks.

Mr. A. J. Nix, one of the senior members of the staff, in proposing a toast to "The New Headquarters," remarked that their own loyalty and co-operation was an important factor, and he saw no reason why they should not confidently anticipate success, in which matter he wished prosperity on behalf of all present to both the Club and the firm. Mr. T. F. C. Potterton, who was cordially received, thanked Mr. Nix for the terms in which he had submitted the toast. He reminded those present that the business was established in 1850 in very different circumstances from those which existed to-day; but he and his co-Directors recognized that success was due in large measure to the interest shown by the senior members of the staff, particularly the brothers Brooks. So far as the future of the Club was concerned, concluded the Chairman, everything possible would be done by the Principals to associate themselves with the objects of the Club.

After dinner there was an enjoyable programme of entertainment and dancing.

Sales Promotion in a "Difficult" Area

Commercial Company's Successful Exhibition

The Main Exhibition Hall

THE fact that the whole area is fully developed so far as building is concerned, that the population is tending to decrease, and that the effect of slum-clearance and re-housing is militating against expansion makes the task of the Commercial Gas Company a particularly difficult one.

To those not familiar with the Company's district the incidence of re-housing is hard to realize; but, as an illustration, one area may be mentioned where 1,524 persons will be displaced from a site of nearly six acres. On this site accommodation will be provided for 1,065 persons—a reduction of 30% on the original number housed. In another case 750 gas meters have been disconnected for some time, and on the site 400 flats will be erected, giving a reduction of 46%. During the long period of clearance, demolition, and re-building, these sites are entirely unproductive, and considerable expenditure has to be incurred for new mains, services, and carcassing pipes. Between thirty and forty acres within the area of the Company are at present in this transitional stage, housing between 6,000 and 7,000 persons, according to present-day standards.

Such conditions as these face the Company with the necessity of making up by other means the loads which are inevitably lost for reasons beyond their control. That they are tackling the problem in a courageous manner by up-to-date sales promotion methods is evident from their policy of holding comprehensive exhibitions and demonstrations in different districts of their area of supply.

One of these—held last week in La Bohême Ballrooms, Mile End Road—we had the opportunity of visiting, and we went away with the impression that, thanks to the Company's efforts, the people of East London are still very interested in gas and gas service, despite the intensive and sometimes hardly fair competition from municipally-owned electricity supply. Indeed, the exhibition proved extraordinarily popular, while the demonstration room, seating something like 350 persons, was full at almost all the sessions, thus indicating the housewives' desire to witness the *whole* cooking operation from start to finish, including preparation, which they are unable to see at the electricity demonstrations held in the area.

Co-operation from Manufacturers.

The exhibition was arranged in co-operation with Ascot Gas Water Heaters, Ltd., Cannon Iron Foundries, Ltd., R. & A. Main, Ltd., the Parkinson Stove Company, Ltd., and Radiation Ltd. Each firm had a section of the main hall, where they showed a wide selection of their latest appliances. Almost every appliance throughout the exhibition was "live," so that demonstrations could be given whenever required. Although the domestic appliances were to this extent sectionalized under the names of their manufacturers, the uniform colour schemes and design of the settings gave the impression of one pleasing whole—typifying all that is latest and best in modern gas service, as well as the spirit of co-operation within the Industry which has so material a bearing on sales development.

In addition to the manufacturers' displays, there were separate sections devoted to large-scale catering apparatus, for which there is a good demand in this area, cafeteria equipment, home laundry appliances and demonstrations, and coke fires. The Ascot display took the form of a tea bar which, as usual, proved highly popular, and led to the sale of a considerable number of water heaters.

The entrance hall constituted another exhibition in itself—this time of all the useful little portable appliances and gadgets which help to make home-running easier, this being the theme of the displays.

Particularly ingenious were the "flashing" lights—worked entirely by gas—which intermittently illuminated various appliances to which it was desired to draw attention. In one instance the appliances were displayed in a series of little windows—styled "Mr. Therm's Picture Gallery." By the operation of this flashing device the appliances in each of the windows were illuminated alternately. In other cases, the portable fires, or other gadgets, stood upon frosted glass bases below which were the flashing lights. The whole display was very effective, particularly at night. The system required no motors or other mechanism, being operated simply by taking the gas supply to the various lights from different meter ports.

Also in the entrance hall was the display of cafeteria equipment already mentioned, together with a striking refrigeration exhibit, the latter including the figure of Mr. Therm, snow-covered as to the body, yet with gas flames emerging around his head.

True to the traditions of present-day exhibitions practice, the Company offered various inducements to purchasers of appliances during the week. All prices were marked down by 2s. in the £,

A Display of Gadgets and Portable Appliances in the Entrance Hall

while each portable fire carried with it the gift of a gas poker. Each visitor was also given a numbered ticket on entering the exhibition, and a draw was made every evening for five prizes—a bowl fire, two gas irons, and two gas pokers.

The Commercial Gas Company are to be congratulated on organizing this fine exhibition; their enterprise was undoubtedly rewarded by the excellent attendances, not only at the exhibition, but also at all the cookery demonstrations. And, perhaps most important of all, good business resulted.

Special Order Applications

A draft of each of the following Special Orders, for which application has been made to the Board of Trade under the Gas Undertakings Acts, 1920 to 1934, has been laid before both Houses of Parliament for approval by Resolution:

Fenny Stratford.—Objects relating *inter alia* to limits of supply, maintenance of works, power to purchase lands by agreement, and limiting price of gas and revision of maximum price.

Ilkley.—Among objects are provisions relating to limits of supply, power to compel repairs in case of danger, and power to borrow.

Knottingley.—Object relates to power to store gas upon certain scheduled lands.

The Joint Gas Conference

Feb. 28 to March 2.

at the

British Industries Fair

OPENING PROCEEDINGS and PRESIDENTIAL ADDRESS.

THE Joint Gas Conference, held under the auspices of the British Gas Federation at the Birmingham Section of the British Industries Fair, opened on Feb. 28 under the Chairmanship of the President, Lord Kennet. A cordial welcome was extended to the delegates by the Lord Mayor of Birmingham (Alderman J. S. Crump) and by Mr. J. H. Allen (Vice-President of the Birmingham Chamber of Commerce), which was duly acknowledged by the President.

PRESIDENTIAL ADDRESS

of

LORD KENNET.

We do honour to one of the greatest men in the Gas Industry by placing the bust of William Murdoch in the official stand of the Gas Section of this Fair. This gesture is doubly appropriate, for many of his triumphs were associated with Birmingham and this year witnesses the centenary of his death, at the age of 85, at Handsworth.

Murdoch left Scotland in his twenty-third year—1777—for the Soho Works, near Birmingham, where James Watt and Matthew Boulton were in partnership. His wage at first was 15s. per week. The association lasted the whole of his working life.

In the following year he was sent to Cornwall for his firm, but returned to the Soho Works in 1798.

I will not say more about this fruitful career, with which, no doubt, you are more familiar than I. But I should like to tell about some things—interesting, at least to me—that I discovered when delving into the origins of the Industry.

I was surprised to find how early coal was carbonized for coke. It was done in China two thousand years ago. In 1620 in England a patent was granted for coking in a closed receptacle. In 1737 a Rev. Dr. Clayton recorded that in addition to tar and oils a combustible gas was formed. In 1781 Lord Dundonald was recovering tar, pitch, ammonia, and oils, but it was not until 1792 that William Murdoch made gas from coal in retorts. So gas really started with its own by-products—it was at first a by-product of what are its by-products to-day.

Lighting was, of course, our first interest. Coal gas was used first experimentally by Murdoch in 1802 in a part of the Soho Foundry of which I spoke. A contemporary writes: "The illumination of Soho Works on this occasion is one of extraordinary splendour. . . . Birmingham poured forth its numerous population to gaze at and to admire this wonderful display of the combined efforts of science and art."

In a few years streets were being lit by gas, and to-day there are 800,000 gas lamps in use in the country—a 40 per cent. increase since 1925. The Industry still has a very big domestic gas-lighting load.

The great merits of gas lighting were stated by the famous, and indeed notorious, Mr. Winsor in a pamphlet, published in 1804 and called "An Account of the Most Important National Discovery for Some Ages." He said that arrangements could be made "to have every apartment of a house lighted and heated from the kitchen or from the wash-house, whichever proves most convenient." He even claimed that "the lighthouses on the coasts may be rendered like blazing stars to guide our seamen over the watery deep; nay, the very signals of vessels and fleets by night may be materially improved and rendered more distinct than in the brightest days." He had no doubt, you see, about maintaining a satisfactory lighting load!

It was some years before it was seen that there was a future for cooking by gas, but in 1847 a pamphlet was published called "The Domestic Uses of Gas." Here we read "Gas may be advantageously employed in the domestic economy to the purpose of cooking." Housewives no doubt appreciated the observation that "the dripping from roasting meat is received in a state of perfect purity in a pan at the bottom of the apparatus"; and the pamphlet ends with an appeal for more use of gas to prevent smoke and fog.

But it was not until the eighteen eighties that gas cooking went ahead in popularity. That movement has gone on, however, and to-day 8 million housewives are cooking by gas.

The use of gas for heating was suggested, as said, by Winsor in 1804, but fifty years later gas fires were still few and primitive. It took many years before they became popular; but to-day three out of four doctors—I think that is right—use gas fires. They put a medical seal of approval upon the method.

The first instantaneous water heater was invented in 1868 by a decorator and signwriter; but before that sheet metal baths—in the days before cast-iron baths—had used water heated by a gas circulator.

In this British Industries Fair can be seen some of the more striking applications of the industrial use of gas—to-day of service to some 4,000 trades. That progress is remarkable when it is recalled that it was only at the end of the last century that serious attention was paid to the subject.

Recent industrial developments have been much helped by the Industrial Gas Development Centres. They mobilize the technical resources of the Industry and the local undertakings put them at the disposal of all consumers. These local organizations, based on the Industrial Gas Departments of larger undertakings, with continual and increasing experience, are co-ordinated by the Industrial Gas Information Bureau in London. Through that, and its committees with their frequent meetings, the experience of the whole Industry up to the last moment is put at the disposal of every undertaking, however small.

Gas has become prominent of late in the service of public health. Schools and public buildings, swimming pools, slipper baths, municipal wash-houses, sports pavilions, hospitals, and large-scale kitchens all use gas. And the Factories Act of 1937 has meant, with the aid of our Industry, much improved conditions for workers, particularly in heating, lighting, ventilation, clothes drying, radiant heaters, and hot water.

The Gas Industry has, indeed, always thought about what it can do for public health, and was thinking about it before the Government took much active interest in the physical health of the citizens. Health services were practically unknown in England and Wales less than a century ago. It was not until 1848 that the first central health authority, the General Board of Health, was established. The Ministry of Health was formed in 1919.

The contribution that the Industry can make, and is making, to the health of the nation has always interested me when I was Minister of Health and afterwards. The Ministry watches our Industry's activities with great interest, as my

friend, Mr. Walter Elliot, told you recently, particularly so in respect of work for the welfare of the worker.

I understand that already notable results have been achieved.

Ruskin called Sheffield a dirty picture set in a golden frame, and that description might well be applied to many industrial centres. Nowadays even the picture has some bright spots. I have been in great factories and steelworks in Sheffield and elsewhere, once so filled with smoke that even the ceiling lights were hidden, where now it is clean enough to eat off the floor. Mr. Therm worked that miracle. These new conditions mean that the worker is more satisfied with his job and does better work: and the employers are saving money.

Once upon a time great clouds of black smoke belching from chimneys were thought necessary to industry. The development of gas as an industrial fuel has proved otherwise. Where gas-fired furnaces replace old-fashioned firing workmanship improves, and so do profits.

The smoke abatement campaign has gone ahead since the Gas Industry has taken an interest in it. The Industry will not claim all the credit for that. We recognize the good work of the National Smoke Abatement Society and others. But since the Gas Industry has joined whole-heartedly in the campaign there has been good progress.

That is not a completely new development. Almost in prehistoric days the Gas Industry had its mind fixed on the smoke problem. The one and only Mr. Winsor even wrote verse about it, and even in those far-off days there were people who realized the dangers of burning raw coal. Here are some of Mr. Winsor's verses, bad poetry but good sense. They were written over 130 years ago, and we should have profited by them earlier:

"Must Britons," wrote Mr. Winsor—

"Must Britons be condemned for ever to wallow
In filthy soot, noxious smoke, train oil and tallow,
And their poisonous fumes for ever to swallow;
For with sparky soot snuffs, and vapours men have constant strife,
Those who are not burnt to death are smothered during life."

And also:

"Most mortals on earth with smoke live in strife,
And many a beauty is smothered alive,
Great London itself th' empor'um of the world,
In clouds of black smoke is constantly furl'd."

Further, according to him—

"Smoke begot chimneys, chimneys beget smoke,
Soot, fires, and filth all prevented by coke."

What a slogan!

Then, referring to criticisms of his scheme, its financial aspects and the security offered, he writes:

"But let Britons be told when of millions they dream,
In many a tedious, doubtful, transatlantic scheme,
Millions at home are wasting in noxious soot and smoke,
Which may be realized in costly light, tar, and coke."

Of late local authorities up and down the country, municipal leaders, from Mr. Herbert Morrison in the south to Lord Provost Dollan of Glasgow in the north, and the Press have all combined to put this great problem of smoke more firmly on the map: and the Government has been active, too.

Meanwhile our Industry is developing the by-products of gas-making. We have to husband national resources nowadays. Things that we used to throw away we must save. What once provided the raw material for a single process now must supply a hundred. The scientist has come into his own, and nowhere more than in this Industry.

It is odd to remember that the ammoniacal liquor and tar which are given off in the making of gas were considered a nuisance a century ago, and were difficult to get rid of. The liquor flowed into the rivers, polluting the water and killing fish, or poured on to the land and soured the crops. Getting rid of tar was just as bad.

Chemistry has changed all that. Instead of paying people to carry the stuff away, we are now developing them on a scale and at a profit which 20 years ago was undreamed of.

Old King Coal has become the Universal Provider, with his benevolent children and grandchildren performing miracles daily in millions of homes and thousands of factories. And it is the Gas Industry which has made it possible.

This Industry distils 230 million gallons of tar a year, to make and mend the roads. It produces 12 million tons of coke—a smokeless fuel which becomes more and more popular each year. Its annual production of creosote for protecting railway sleepers, telegraph poles, etc., is more than 300,000 tons. Of sulphate of ammonia, widely used as a fertilizer, it produces 80,000 tons a year.

But that is only a part of the story. Coal carbonized in the gasworks is the base of an infinite variety of things—from mothballs to umbrella handles, from buckles to motor-car bodies. Coal tar is the base of hundreds of medicines, scents and antiseptics, from the humble aspirin to the disinfectants used by every hospital.

The annual British production of benzole approaches 50 million gallons—a useful amount in any emergency when foreign supplies of motor spirit may be cut off.

Textiles have been transformed by the synthetic dyes which colour our clothes.

In short, we may claim that this Industry is a model to all others in the avoidance of waste. From its base raw material of coal it makes possible the manufacture of thousands of subsidiaries. Not even the dust from the flues of the retort ovens is wasted; it makes good liquid metal polish, which keeps our door knockers bright.

Coal is our national heritage. The Gas Industry is helping to ensure that it is used to our national advantage.

In addressing you last year, my distinguished predecessor in office, the Earl of Dudley, drew a picture of a Britain without a Gas Industry. It seems to me that the Industry becomes more and more indispensable as the years go by. The Gas Section in this great Fair shows that gas is not only extending its hold in fields it has occupied for long, but is pressing forward into new territory. That advance will, I know, be to the great advantage of the nation in many vital respects, and I look forward with confidence to another twelve months of progressive service.

Vote of Thanks.

Coun. W. P. JACKSON (Manchester) proposed a cordial vote of thanks to Lord Kennet for his Address. He said they were very glad of the great public work that he had done, but nothing gave greater gratification to the members of the Gas Industry than his having presided that day. He suggested that it would be a great advantage to a Minister of Health to preside at such a Conference as that before he undertook the responsibilities of office, because the use of gas, particularly in reference to the atmosphere of some of our great industrial towns, would help greatly to improve the health of the people.

Mr. ERNEST WEST (Manchester) seconding, said the Gas Industry, as Lord Kennet had remarked, had become an indispensable feature of our economic system. It must be remembered that although we appeared just at present to be depending more and more upon imported liquid fuels that was a state of things which could not last indefinitely. A distinguished American gas and electrical engineer had pointed out that whereas the life of our reserves of coal was to be reckoned in hundreds, or even thousands, of years, with regard to oil—he would quote the actual words—"the tendency to develop new reserves during the past five years was considerably below the present rate of use, in spite of the increased knowledge of geology and geophysical exploration." That was considered of great importance in America, and surely it should be no less appreciated here. Lord Kennet had said that "Coal is our national heritage." Mr. West suggested that they should recognize beyond any shadow of doubt that coal was ultimately the only permanent basis of those supplies of heat and energy upon which their civilization rested and will rest for as long as they could see ahead. The claim of the Gas Industry was that it made the best use of coal supplies. Not only that, but it also provided, here and now, a solution of the smoke problem to which Lord Kennet gave prominence in his Address. The Gas Industry returned to the consumer 80% of the heat value of the coal which was entrusted to it in the form of two clean smokeless fuels, gas and coke; and given a fair chance and proper support it could supply these fuels at a total cost for fuel which was not greater than that of coal itself to the consumer when due allowance had been

made for the much greater efficiency in the use of the two prepared fuels.

The PRESIDENT read a telegram from Mr. Smith (Chairman of the Joint Gas Conference Committee), regretting inability to be present and offering good wishes for a successful meeting.

Replying to the vote of thanks Lord KENNET said he had no financial, industrial, or commercial connexion with the Gas Industry, but a speaker had put his finger on the spot in referring to his interest and the interest of the general public in the Gas Industry as a great promoter and preserver of the amenities. The foulest evil in our towns was the smoke evil, and he saw, as every man of reason must see, in the consumption of smokeless fuels by the methods that the Industry advanced the best deliverance.

THE CONFERENCE PAPERS

Retention and Development of the Domestic Load

BELOW we publish the four Short Papers which were presented at the Joint Gas Conference at the British Industries Fair, Castle Bromwich. These deal with different aspects of "The Retention and Development of the Domestic Load."

SPACE HEATING

By G. E. CURRIER, M.I.Mech.E., Bradford

Introduction.

I appreciate the honour of being invited by the Programme Sub-Committee to deputise for Mr. T. P. Ridley, of Newcastle-upon-Tyne and to submit a short Paper on Space Heating to the Conference. Mr. Ridley is recognized throughout the Gas Industry as being an authority on Gas Sales and Tariffs, and his previous Papers have aroused the keenest interest and given much food for thought. I can only hope that this Paper will be sufficiently provocative to promote a useful discussion.

The retention and development of the domestic load is the major problem confronting most Undertakings to-day. Expansion in the use of electricity in the home at once comes to mind as being one of the chief reasons for this position, but there are other considerations which affect the question.

Since the Great War the social habits of the people have changed greatly, with the result that there is much less home life, and modern conditions provide new attractions for people outside their homes. With all these changes, however, the consumption of coal used for domestic purposes still amounts to twenty-five to thirty million tons per annum, and this is used largely in open fireplaces.

The thermal efficiency of utilization of coal in the open fireplace can be taken as being between 20 to 25%, therefore, if we allow 300 therms per ton of coal, the national domestic heat market amounts to 2,250 million therms. Most of the domestic coal is used for space heating, and if it was replaced by gas, allowing an average efficiency of 60% for the various methods of gas utilization, then the total load under this heading is found to be 3,750 million therms, which is more than double the total annual output of the Industry, and it is obvious that the potential load is enormous.

Many questions immediately come to mind when considering the possibilities of the space heating load:

(1) Can the public be educated and persuaded to change over from solid fuel to gaseous fuel as such?

(2) Does the Gas Industry really want the domestic space heating load or is it to remain content with the gas fire in the downstairs room used occasionally, and gas fires in one or two bedrooms, giving a total consumption of perhaps 50 therms per annum?

(3) Is the cost of appliances likely to be a deterrent to those of the public who may be willing to change over to gaseous fuel? Can appliance prices be reduced?

(4) Can the fuel and the appliances be sold at such prices as will attract this load?

The conservatism of the Britisher must be remembered, and while the change-over to gaseous fuel can and will be accelerated, in the absence of legislation it is not likely to be complete. To-day we find in a majority of houses the solid fuel fire in the living room supplying 90% of the space heating requirements of the household, in addition to providing part, if not all, of the hot water requirements, and being used for some of the cooking operations. Against this is the fact that the public is becoming more heat conscious, and recent Government regulations relating to heating of shops and factories will no doubt assist this trend. The Industry cannot be satisfied with its present share of the space heating load. As the desire for more general heating in the home increases, coupled with the demand for cleanliness and a fuel on tap, so will there be greater opportunities for gas to fulfil these requirements.

In the case of householders changing over to all-gas houses, one difficulty to overcome is the initial cost of appliances. It is possible to increase existing load with existing appliances once they have been installed, but to get new load means persuading landlords or householders to scrap existing appliances and face up to new capital expenditure. The total money available for fuel in winter in the case of the average householder is about 4s. per week, and two gas fires on hire-purchase terms will cost an additional 6d. per week; hence the need for standardized appliances at rock bottom prices, about which more later. The cost of fuel varies in different districts, but, speaking generally, the price of gas for domestic space heating must be in the region of 4d. per therm.

Time will not permit me to deal more fully with the comparative costs of various fuels.

Appliances.

(1) *Direct Self-heated Appliances for Independent Room Heating.*

Gas fires, radiators, portable heaters can all be used for the domestic space heating load in their proper spheres. Many modern houses are not fully equipped with flues, and our united efforts should be increased towards remedying this

position, commencing with the Ministry of Health down to our local architects and builders.

Recently-developed appliances which, however, are dependent in part on electrical energy, are air heating units equipped in some cases with air conditioning. It is not likely, however, that these will be in common use on account of their high cost and complication, and in any case are more likely to be developed as general rather than local heating appliances.

Radiant panel heaters are making considerable progress in space heating, but hardly come within the scope of this Paper.

Manufacturers are to be congratulated on the striking improvements in heating appliances in recent years, such as self-lighting devices, efficiency, appearance, and finish, and the following suggestions and criticisms in respect to gas fires are submitted in no carping spirit:

(*a*) ***Appearance.***

Still further improvements are desirable in the appearance of the heat source, and these should be in the direction of giving a more lively appearance to the flame—something in the form of flicker is desired. In most types the position of the control tap could be made more convenient.

(*b*) *Maintenance.*

Cleaning of burner discs is in some cases more frequently necessary than one would wish. It is well known that the accumulation of fluff in such cases can easily be dispelled by back-lighting the burners, but this can only be considered to be an expedient and a better solution is necessary to this problem.

The duplex tap supplied with most fires has proved to be a convenience appreciated by the consumer, but unfortunately the use of the central radiants only results in a dark deposit on the outside radiants which does not improve the appearance of the fire. Again the remedy at present is to use the outside radiants, but it would be better still if there were no deposit without their use.

(*c*) *Efficiency and Ventilation.*

It is well known that as the ventilating effect of a gas fire is reduced, so the total efficiency increases, and it is suggested that it is not desirable to aim at more than 70% efficiency. We still suffer as a result of the bad impression made years ago by gas fires with inadequate ventilation.

Prices of Gas Fires and Convectors.

With regard to prices, fires appear to be much dearer relatively than cookers. The seven radiant fire costs approximately half as much as the popular size vitreous enamelled cooker complete with all fitments. Compare the large number of castings, assembly, and finishing operations of the cooker with its vitreous enamel finish against the apparent simplicity of assembling three main castings and the paint finish of the gas fire, and it is difficult to understand the high prices demanded for the latter appliance. Also when we are competing with all tile pre-cast fireplaces and overmantels, the cost of which, inclusive of fixing, is from £4 10s. upwards, the position is aggravated.

Similarly with regard to the convector, which, after all, is a relatively simple appliance in construction, the price does seem to be unduly high.

These criticisms are made having due regard to the greater number of cookers sold, and probably the relatively less expensive publicity required to effect such sales.

(2) *Indirect Heating Units.*

These are not likely to be fitted to medium-sized and inexpensive houses, but are rapidly developing where initial outlay and running costs are considered in the light of convenience and cleanliness. The average installation cost for central heating equipment complete will be in the region of £5 per 1,000 cu.ft. space heated, and the system cannot be considered to be satisfactory unless applied to the house generally. With many of the gas-fired central heating boilers, the finish and appearance do not outlast the first season's working unless conditions are very favourable and very good attention is given.

I consider that the ideal system of domestic space heating is by means of a gas-fired central heating system to maintain a temperature of 55° F., this being supplemented with radiant heating to a temperature of 65° F.

Gas and Coke Combination.

A combination of gas fires and coke fires provides a most economical means of space heating in the poorest homes, and in Kensal House the Gas Light and Coke Company have provided an outstanding example of the use of this combination of two smokeless fuels at less cost and with greatly increased comfort than is usually obtained from the use of raw coal. I have been asked to confine my remarks in this Paper to gas, and I only wish to add that so long as there is the necessity to dispose of coke as a by-product of the manufacturing process, the use of coke in the domestic field should be encouraged, and with the probable trend in the coke market, will have to be extended. The main disadvantage of coke fires is their failure to satisfy the automatic requirements of the press button age in which we live.

(3) *Appliance Prices—Standardization.*

Under the competitive conditions existing to-day, any reduction in the price of gas or appliances is particularly welcome, and I am glad to have this opportunity to put forward a few points in respect to standardization of appliances. Many manufacturers are in competition for the business, and one would expect the prices of gas fires, radiators, &c., to be at a commercial level. I think that this is the case, but I do suggest that if all these firms set out to manufacture the popular sizes of fires, radiators, and portable heaters to a standard agreed by a panel of experts representing suppliers and buyers, and for this purpose pool their technical and commercial resources, then the prices would be substantially reduced and brought down to the absolute minimum. In making this plea, it is not suggested that the high grade appliances should be made to the standard or that they should be withdrawn—in the manufacture of such appliances, each firm would have scope to embody any special features or gadgets and thus, to some extent, retain the individuality of the firm. I know that the manufacturers will immediately point out that many Undertakings specify special features on popular appliances—in some cases just the name must be different, but in all cases increasing the cost of production. With standardization on the lines suggested, Undertakings requiring a special name or special anything else on the appliance would only be able to obtain such special features on the high grade appliances and presumably at high grade prices. A difficulty may arise due to the fact that some manufacturers are members of the Society of British Gas Industries and others are not, and, of course, there will be other difficulties to surmount, but if the Undertakings will co-operate, and both sides are determined, then the task is not insuperable. Some of the large Companies and also the Holding Companies have already made progress along the lines indicated, but it is essential that the whole Industry is brought into line. I feel sure the manufacturers will respond if a lead is given by the Undertakings. I imagine that many Undertakings spend time and money on the testing of new appliances on the market, resulting in much overlapping. Why not a Central Laboratory and Bureau (using if possible existing Institutions), supported by the whole Industry, from which such information could be obtained.

Meters are linked up with appliances, and this process of standardization should also be extended to meters, as I am informed that the old lights type has still to be manufactured to meet the requirements of certain Undertakings, and, further, in the modern high capacity type special features are demanded by this or that Undertaking. If any Undertaking

requiring special features in meters was called upon to pay shillings more per meter, the demand would immediately fall to *nil*, just as the Optional Prepayment Meter has become so very popular because there was no additional charge for it, and incidentally, what percentage of these meters are used as optional? A further thought, why not one mechanism for all prepayment meters? In short, more co-operation between all the manufacturers and all the Undertakings is essential.

Tariffs.

The necessity for promotional tariffs to meet competition is obvious to all who have experienced the intensity of the competition which exists in some towns to-day, and, therefore, needs no reiteration. Carefully designed Two-Part Tariffs and Block Tariffs are now in operation in many Undertakings and offer attractive terms for the development of the space heating load.

The Bradford Two-Part Rate was put into operation in July, 1933, and more than 25% of the domestic consumers are on this tariff. Domestic dwellings are divided into two classes only:

(*a*) Non-parlour type houses which pay a standing charge of 26s. per annum.

(*b*) Parlour type and large houses which pay a standing charge of 52s. per annum.

In each case the charge for all gas consumed is at the rate of 3·6d. per therm, and all accounts are subject to a discount of 5% for prompt payment.

Progress has been made with this tariff in developing the space heating load, but I frankly admit that, taken as a whole, this progress is small and by no means spectacular. In those cases, however, which have changed over completely to gas for heating, the increase of consumption is striking.

Once the coal fire is displaced for continuous heating, the way is open to larger consumptions than we ever considered possible, and further, they prove to me at least that the Englishman's supposed preference for "the flicker of a coal fire" can be overcome. Given the right fuel and the right price he automatically forgets his previous likes and dislikes.

Fuel Policy—What of the Future ?

The Coal, Gas and Coke, Electrical and Oil Industries are to-day in ruthless competition for that elusive 4s. per week which the Ministry of Labour estimates is spent by the average householder during the winter months for fuel.

The Coal Utilisation Council has set up a Research Organization, one of the main objects of which is to design appliances to burn raw coal and supply heat with a minimum production of smoke. If as much success is achieved with the domestic grate as has been accomplished with the automatic coal stoker for central heating boilers, then they will still be a long way from smoke elimination. Even if they succeeded in smoke elimination, the wastage of by-products would still proceed unabated.

One bright spot has been the co-operation of the Gas and Coke Oven Industries in operating an agreement for the export of coke, and it is hoped that agreement in all districts will soon be reached for the inland sale of both classes of coke.

Returning to coal, gas, and electricity, when one considers the money and effort expended by each for its own individual development, and at the same time remembers the crying need for smoke abolition, the national need for increased quantities of benzole, then one cannot but be appalled at the useless waste of this civilized age.

Any mutual scheme for the sane distribution of the various loads between these three industries in the best interests of the nation does not appear to be within the realm of possibility and sounds more like Utopia.

There remains then the continuance of the present unsatisfactory state of affairs, or setting up of a National Fuel Board to control the Coal, Gas, and Electrical Industries, and I think this latter is likely to come about much sooner than many like to think possible.

COOKING

By G. DIXON, B.Eng., M.Inst.C.E., Nottingham

" The Domestic Load is the Backbone of the Gas Industry : Cooking is the Backbone of the Domestic Load."

We do not claim originality for the above; it has probably been said many thousands of times before and is only repeated now to emphasize an important irrefutable fact.

Let us agree on this.

Let us also agree and constantly bear in mind that gas sold for cooking purposes yields our highest return for profit, and that of all the domestic utilizations, the cooking load is the least seasonal. Further, the demand for cookers to be fixed and exchanged is steady and reliable and is the main factor in keeping the wheels turning both in the fittings sections of the supply undertakings and in the manufacturers' works.

Now the essence of the whole business is to supply consumers with what *they* think they require on terms which *they* think they can afford. And to formulate a policy on this basis calls for consideration of the following primary points:

1. Classification of consumers—their needs in relation to their pockets.
2. Policy for new fixing.
3. Policy for exchanges.

1. *Classification.*

The Classification generally accepted is as follows:

Class A.—Those who are assisted in their households by the employment of two or more servants.

Class B.—Those who can afford some assistance but who share domestic duties.

Class C.—Those who, of necessity, do all the housework.

These three Classes could be further analyzed and discussed at some length, but broadly speaking they affect the Industry to this extent: Class A represents probably not more than 10% of the total consumers, and can afford to consider the purchase of the best and most expensive types of cookers the Industry has to offer. Class B accounts for about a further 40%, and it is with these that the bulk of our medium hire-purchase business is being done, to a great extent at the expense of established simple-hire. Class C represents the remaining 50% and are those who, due to their circumstances, just cannot afford to pay anything at all for the cooker they need every bit as much as the other classes.

2. *Policy for New Fixing.*

What do we offer these classes from a "New Fix" point of view? Let us assume that a limited range of simple-hire black cookers is available at rentals of from 1s. 6d. to about 4s. 6d. per quarter in addition to a full range of hire-purchase enamel types. Class A is very well catered for, being offered an extremely wide range of choice among the numerous high-grade cookers available, from the sale of which we are all well content in the knowledge that a first-class appliance has been sold at a first-class price, yielding a first-class profit.

Class B is the class for whom we employ salesmen. The cheapest all-enamelled cooker with oven heat controller and backplate on hire-purchase available to the public to-day is in the region of 7s. per quarter, including fixing. To get down to this figure the supply undertaking must be prepared to forego all "profit" and extend the period of payment over at least seven years. The salesman's task is to put this proposition over *with* its hire-purchase obligation against a 2s. 6d. simple-hire proposition *without* any obligation. We will refer again to this difference.

As to Class C we are not clear as to what the Industry as a whole does offer, but bearing in mind the fact that the prepayment consumer is entitled to something in addition to the meter, we in Nottingham provide a single-cased cooker free of charge and are content to do so.

This, then, is what the Industry offers to all classes for "New Fixes" in theory—but is the offer genuine in fact?

From a hire-purchase point of view we believe it is, but for simple-hire and free types we are not so certain. In how many instances are orders taken in the full knowledge that they will be merely attached to the end of a long waiting list, and in some cases never executed; during which time the victim may write anything up to four letters and finally relapse into a silence which can have only one meaning. And next season we hope to sell water heaters and fires to these same people!

3. *Policy for Exchanges.*

This obviously only applies to simple-hire and free cookers and is considered here after every reasonable effort has been made to effect a sale. A demand for an exchange may be made under any of the following conditions:

(*a*) Change of tenancy (existing cooker dirty).
(*b*) Cooker defective.
(*c*) Larger or smaller type required.
(*d*) Better or cheaper type required.

Applications for exchange may be received through any of the following sources:

(*a*) Showrooms.
(*b*) District inspectors.
(*c*) Fitters.
(*d*) Maintenance men.
(*e*) Meter inspectors.

Each undertaking must determine which of the above sources shall be subject to check before confirmation, but having confirmed them, to what extent again does theory become fact. On this point we suggest that there is not an undertaking in the country less than seven days in arrear, and, generally speaking, a week is a fair time in which to carry out any reasonable request from a customer by any business house alleged to be laid out for the purpose.

At this stage it is advisable to reflect for a moment on our showrooms to determine whether we are not more concerned with the sale of cookers than with goodwill and gas. At the risk of being too provocative we would also stress the importance of carefully checking up the attitude of our salesmen towards those who cannot afford to buy. In too many cases we suggest it has got down to a process of pushing a form forward with a curt "sign here" in order that he may hurry forward to Mrs. Class A. who, after all, only wanted to know if we could exhibit the prizes for her charity bridge drive in our best window. And we invariably say how pleased we shall be.

As we have stressed simple-hire and free cookers to some extent, we feel we should make it quite clear that we are definitely in favour of a hire-purchase policy and fully appreciate the many points in its favour, but although we agree that hire-purchase can be pursued to the exclusion of all else so far as the development of our hot water and heating load is concerned, we are convinced that the same does not apply to the cooking load. Simple-hire has been too deeply rooted in the Industry to be suddenly cast aside, and there are too many black cookers on the district. We believe that those undertakings who consider they have a "black cooker" problem—*i.e.*, embarrassment from the number of black cookers in stock, have made the position for themselves by the non-observance of this fact. We consider that the pursuance of a good hire-purchase policy with Classes A and B will ensure a sufficient return of black cookers to meet the demands of C.

Cooker Renovation.

This suggests a word on cooker renovation.

We have made many experiments in Nottingham from which we have come to the conclusion that the best method is by means of incineration, shot-blast, paint spraying, and stoving. Further, that the only suitable and reliable paint colour is still black. With regard to the vitreous enamelling of old cookers we have yet to be convinced that this is a proper policy. If anything further than the enamelling of the exterior is to be attempted we feel it is a better proposition to pay the extra for a really new and modern cooker.

We are often tempted to ask those who follow this practice whether they are carrying out in theory and practice the "New Fix" and "Exchange" obligations we have outlined, and if the fact that they are stocked up with old cookers is because they have failed so to do.

The Relationship Between the Manufacturers and the Supply Undertakings.

Does the latter think of itself as the parent Industry and regard the manufacturers as one who makes a feeble attempt to produce the appliances necessary to enable it to sell its gas? Or does the manufacturer regard the supply undertaking as its selling organization who should have been given the sack long ago? Both are fundamentally correct, and in some instances literally true. But what does stand out clearly is the need for the closest co-operation by a joint realization of the problems confronting both parties and the need for some degree of standardization both in policy and product. Much good would come if everyone who took exception to any particular feature had to give a good solid reason rather than express his own particular private whim.

Every appliance produced either has, or has not, a place in the Industry. If it has, it should, on adoption, be brought to the notice of all concerned from a selling, fixing, and maintenance point of view and be properly listed and exploited. It should not be left to the storekeeper to "try another one" after the initial sample has been sold, and thereafter probably forgotten. If it has not a place, co-operation should be such as to prevent it ever being put into production. Manufacturers are bearing more than their share of responsibility in the production of new appliances and are in many cases spending large sums of money to present something new, which is subsequently wasted due to the almighty supply side turning it down because they do not want or like it. We feel it is all wrong at the B.I.F. each February for the manufacturers to be put on trial to the supply undertakings with the developments of the previous year. How much better it would be if the goods displayed were the result of joint consideration and co-operation, thus fulfilling a real instead of a problematic need.

The "New Fix" Policy of the Supply Side as it Affects the Manufacturers.

Now to revert for a moment to the "new fix" policy with particular reference to the large gap which exists between the average simple-hire rental and the lowest hire-purchase quarterly instalment, a difference of about 5s. This gap must be bridged by the production of a cooker of modern appearance in the region of five pounds. Such a cooker would open up a further vast market. It has got to be done and manufacturers might as well face up to it now as later. And they need have very little concern in the matter. We are perfectly certain that the introduction of the Austin 7 and Morris 8 not only opened up a tremendous new field for motoring, but did much to develop the demand for better and higher priced cars.

When this time comes, it will be up to the supply undertakings to make their contribution by putting it on the market at the lowest possible price. We do not suggest that any appliance should be put out at a loss, but it apparently serves the purpose of some undertakings to load the cost price with charges for fixing, maintenance, interest, and profit to such an extent as to remove entirely the appliance from the field or class for which it was rightly intended.

The policy of taking large profits out of hire-purchase is wrong. We are gas supply undertakings and the practice of taking profits from our subsidiary activities is not only wrong but against the fundamental principles on which our most prosperous Industry has been built.

It is realized that this Paper has been purposely made provocative.

It is realized that it may be misconstrued as a challenge in favour of the retention of the black cookers.

Let us, therefore, say at once that we are 100% in favour of the pushing of modern enamelled cookers wherever possible, but we are convinced that owing to circumstances brought about by the Industry's sound policy of providing some means of gas cooking to the poorest of our consumers there

must remain a place for the black cooker of modern design and reasonably good efficiency.

We are also satisfied that the economics of the case—in spite of any competition from our electrical friends—supports our contention.

In 1933 we commenced the complete re-organization of the distribution and sales policy in Nottingham. Our feeling at that time so far as domestic cooking was concerned was that we had to formulate a plan to consolidate this load and look forward for increased consumption in other fields. What we have preached to you to-day we have practised during the past six years, in theory and in fact—with a minor lapse or two. The results obtained are as follows:

On March 31, 1933, we had 77,974 cookers on the books of which 30,314 were black simple-hire types and 37,845 black free types. On March 31, 1938, the total number had reached 94,313, an increase of 16,339, or 20·95%.

During the five years we lost 485 black simple-hire type, 1939 black free type, and gained 18,763 hire-purchase types.

"The Domestic Load is the Backbone of the Gas Industry;

Cooking is the Backbone of the Domestic Load."

WATER HEATING

By W. W. TOWNSEND, Colchester

For the development of the water heating load certain things are required, which may be set out as follows:

(1) An adequate supply of gas in all parts of the district of regular quality at a reasonable price.
(2) A supply of well-made and reliable water heaters to meet all the varying requirements of the consumers.
(3) Attractive sale, hire-purchase, and hiring schemes to suit all types of consumer.
(4) A skilled staff of fitters to fix the apparatus in accordance with proper regulations designed to ensure efficiency of operation and safety in working.
(5) An adequate and comprehensive system of regular maintenance.
(6) A sales organization, comprising showrooms in which the apparatus is displayed at work, and a well-instructed selling staff both in showrooms and on the district.

(1) With regard to (1), it cannot be too often stressed that the ideal gas should be unvarying in quality as to calorific value, specific gravity, and air required for combustion, within narrow limits, and that its sulphur content should be low and its inert constituents reasonably low. As to pressure, unless the pressure at the service is reasonably constant at all times a governor should be fitted to every appliance.

(2) There are on the market well-made and reliable water heaters of all types, and in making a selection gas undertakings will obviously bear in mind the requirements of the consumer and the efficiency of the machine, taking this term in its widest sense, to include not only its thermal efficiency, but also the questions of maintenance and durability.

(3) Consumers cannot buy more gas unless they have the apparatus in which to burn it. For this reason it is of supreme importance that the terms offered should be attractive. A certain amount of business can always be done by outright sale, a larger business can be done on hire-purchase, but to obtain orders on a large scale simple-hire is, in the writer's experience, indispensable. The new Hire-Purchase Act will make this type of business far less attractive, and will add further inducements to gas undertakings to take the plunge and seriously tackle the problem by offering all types of water heater on simple-hire.

For several years past Colchester consumers have been able to hire (*a*) a complete hot water installation of the storage type, (*b*) a sink water heater of the storage type, (*c*) a wash boiler, (*d*) a circulator boiler for attachment to a coke boiler cylinder. The single exception up to date is the single-point instantaneous heater (or geyser), and this is generally purchased by the builder, who thus provides his tenants with a hot water supply for the bath in the cheapest manner.

The figures given in the appendix show that this policy has had the desired effect.

(4) A Committee was appointed by the British Gas Federation last year to draw up specifications for fixing all types of water heaters. When issued these will supersede the "Instructions for Fixing Geysers" issued by the National Gas Council several years ago, and which are now out-of-date.

As the Chairman of the Committee the writer would like publicly to acknowledge the great help rendered by the representatives of the Society of British Gas Industries, who, as manufacturers of the appliances, have a specialized knowledge which has been invaluable.

It is hoped that when the book is published it will be generally used by the Industry, as everyone who has experience of the fixing of water heaters is aware that they provide many baffling problems.

(5) In the writer's opinion a regular scheme of free maintenance for all water heaters, whether hired or purchased, is an essential if satisfactory results are to be obtained. It is of no use to fix the best of appliances and leave them alone, and it is unwise to wait until the consumer complains, because he will not do so, as a rule, until there is a serious drop in efficiency. The cost of a full maintenance service is, of course, considerable, and though free as far as the individual is concerned, it is, of course, borne in part by the charge made for hire, and the balance is merged in the price charged for gas. The writer recently had an opportunity of examining the accounts of a municipal electricity undertaking. Seven years was the period allowed for repayment of loans on domestic apparatus, and adding together the interest and sinking fund charges, and the cost of maintenance, the amount received for hire was only 37% of the sum. In other words, 63% of the expenses were being defrayed out of the general revenue from the sale of current. As their policy is in general simple-hire of water heaters, the writer submits that we cannot afford to rely entirely on hire-purchase, and to increase these charges by adding maintenance costs in order to make the appliance business entirely self-supporting.

(6) It is unnecessary to stress the advantages of a proper sales organization further than to say that the writer is a firm believer in the policy of employing outdoor salesmen to supplement the work of the showroom staff. Such men should be employed whole time by the undertaking, specially trained for their work, and given a bonus on the orders obtained.

As we are dealing with the domestic load, no reference has been made to central heating. Gas is offered in Colchester for this purpose at attractive prices from 6½d. per therm downwards in accordance with the quantity used, but though it is making progress for the heating of office buildings, shops, and institutions, there are only one or two domestic installations.

APPENDIX A.

COLCHESTER GAS COMPANY.

	1931.	1938.
Total gas sold, therms	1,361,538	1,606,417
Number of ordinary consumers	2,897	3,305
Number of slot consumers	7,988	10,294
	10,685	13,599

—	1932.	1933.	1934.	1935.	1936.	1937.	1938.
Gas sold per ordinary consumers, therms	210	206	206	214	212	221	214
Gas sold per slot consumer, therms	82	83	80	78	80	83	83

Ordinary price of gas, 10·6d. per therm throughout.

Water Heaters Fixed 1931–1938 Inclusive.

—	Sold or H.P.	Hired.	Total.
Geysers	1,263	5	1,268
Wash boilers	1,003	985	1,988
Multi-points	281	99	380
Sink heaters, storage type	18	1,549	1,567
" " , instantaneous	133	*Nil*	133
Storage water heaters	16	113	129
Circulators	20	15	35
Miscellaneous	39	*Nil*	39
	2,773	2,766	5,539

HIRE CHARGES—
Wash boilers, 2s. 9d. per quarter ordinary consumers, fixed free.
" " , 1s. 6d. " " slot " " " "
Sink water heaters, 3s. per quarter, fixed free, three years' agreement.
Multi-point water heaters, 10s.–15s. per quarter, fixed free with three water points, three years' agreement.
Circulators, 30 ft. per hour size, 7s. per quarter, including lagging of cylinder three years' agreement.

COMPETITION.

COLCHESTER CORPORATION ELECTRICITY DEPARTMENT.

HIRE CHARGES—
Wash boiler wired complete, 4s. per quarter.
1½ gallon sink heater wired complete, 3s. 6d. per quarter.
16½ gallon hot water cistern wired complete, 7s. 6d. per quarter. One hot water point only.

TARIFF FOR WATER HEATING—
Standing charge based on floor area at 2s. 3d. per 100 sq.ft., *plus* ¾d. per unit during winter quarters, ¼d. during summer quarters, with unlimited use. As alternative, with time switch cutting out during peak load periods, standing charge *plus* ¾d. all year.

APPENDIX B.

MAINTENANCE COSTS PER APPLIANCE.

YEAR 1938.

Appliance.	Total Number.	Labour and Material.	On Cost.	Total.
		s. d.	s. d.	£ s. d.
Sink water heaters, storage type ..	1,567	3 10·9	2 9·6	0 6 8·5
30-gallon storage circulators ..	129	17 11	11 1·66	1 9 0·66
Circulators	35	4 3·2	2 5·3	0 6 8·5
Multi-points	176	16 1	9 5·75	1 5 6·75
Miscellaneous	3,632	3 10·5	2 0·67	0 5 11·24
Total	5,539	4 5·2	2 10·6	0 7 3·8

Total cost of maintenance of all water heaters £2,027 1s. 11d., including on costs.

	£	s.	d.
Capital cost of hired water heaters	= 8,651	0	0
Interest at 4% and depreciation at 10% ..	= 1,236	0	0
Amount received for hire	= 1,656	0	0
Debit against revenue (= 0·24d. per therm) ..	1,607	0	0

LIGHTING AND GENERAL APPLIANCES

By W. CLARK JACKSON, M.I.Mech.E., Neath

My contribution to the subject "The Domestic Load—Its Retention and Development" is that section dealing with Lighting and General Appliances.

In this short Address I shall endeavour to give the reasons which have enabled the Neath Gas Department to retain and develop gas lighting in the domestic field.

In 1920 I was greatly impressed by the psychological effect that electric lighting was having on the public mind generally, its attraction as something new, its ease of handling, and its freedom from having to be regulated or controlled by the consumer.

I was also impressed with the fact that the public were prepared to pay a higher price for electricity than for gas to obtain these benefits.

After somewhat lengthy consideration I formulated a scheme which received the support of my Committee and which was as follows:

(1) To purchase only the very best types of gas burners and to supply these at bare cost price, fixed free, so as to bring up the standard of domestic gas lighting.

(2) To institute a service of free maintenance and for this service to be given at much shorter intervals between visits than had previously been the practice in the Industry.

(3) To organize on a fairly extensive scale publicity for gas, including gas lighting, and the adoption of a slogan "Gas for Service."

This slogan still remains with us and is used in every bit of publicity.

It was also realized that the public are influenced by the conditions they meet with in their everyday life, and in addition to improving the domestic lighting it was decided to modernize the public lighting, the lighting of all schools, where gas was still in use, and to improve where possible the lighting of our showrooms.

During the following year, and after some little experience with male maintenance inspectors, it was eventually decided to engage women for maintenance work, and I personally consider that this was the finest step forward that could have taken place.

I am firmly convinced that for general maintenance work women are much to be preferred to men, in any case this has been my experience at Neath and the results obtained justify this opinion.

The aim adopted for visits was that each consumer should be covered once in every eight weeks, or approximately six visits per annum, and for the first few years this period was strictly adhered to.

I need hardly make mention of the huge numbers of inefficient lighting points which this maintenance scheme unearthed, and which have since been entirely replaced by modern gas burner and fittings equipment.

It has always appeared to me rather sad that while a few of us were fighting hard to retain and expand gas lighting the general trend in the Industry was to concentrate on the cooking and space heating loads, and almost to overlook the lighting load.

As a result of our policy the present generation at Neath have grown up with an appreciation of all the benefits that gas can give, including adequate and efficient lighting.

It cannot be denied, however, that during the past few years competition has intensified and that lighting business has been lost here and there, more particularly where customers have gone in for an all-electric wireless set.

In these cases, however, we have started off by having the goodwill of our customers and have had very little difficulty in retaining for gas the lighting of either the kitchen or living room and which has meant very little reduction in the all-in consumption of gas from the particular houses concerned.

It is also a fact that in the houses built during the past few years by speculative builders to sell at from £450 upwards, it has been very difficult to get any gas lighting contracts, although there has been no difficulty whatsoever in retaining gas for cooking, space heating, and to an ever-increasing extent water heating.

An interesting case, however, which is worth repeating, arose in 1936, and when a local builder who was erecting some 100 houses came to me in distress owing to the fact that he had sold beforehand a very large number of these houses and that prices for materials had in the meantime gone against him.

His enquiry was whether I could see my way to reduce the Gas Department's contract, and after careful consideration I suggested to him that I would be prepared to reduce the price per house by the sum of 10s., providing he would not wire the living room for electric lighting, but would allow the Gas Department to fit a gas lighting point in this room at its own expense. This offer naturally was an attractive one to the builder and was readily accepted.

I can assure you that the result has also been very attractive to my Department, and has clearly shown that the value of one gas lighting point in a living room, extensively used by the family, is approximately 10s. for each of the winter quarters.

So far as the houses erected by the Corporation are concerned, no difficulty whatsoever has been found in retaining gas lighting.

The number of houses actually built during the past ten years is now nearing the 500 mark, and as most of the sites are on the outskirts of the town, thereby involving heavy main-laying costs, the retention of gas for lighting has been of great financial benefit to my Department.

In very many of the smaller houses erected by speculative builders we have also been able to install gas for lighting, and in quite a number of cases the original electric lighting, as installed by the builder, has been displaced by gas.

The service rendered by the female maintenance staff to domestic consumers has also been backed up by sending out from the works gas of regular standard quality, both as regards calorific value and specific gravity, and every possible step has also been taken to ensure adequate district pressures, although this latter has meant a heavy expenditure on new mains.

Lectures to the whole of the distribution staff are given during each of the winter months (in the Gas Department's time) and advantage taken at the first lecture, usually in October, to discuss gas lighting and any developments or

Here it is!

The MAIN 527 "STREAMLINED" GAS COOKER

Solidly built, principally of cast-iron to ensure stability and long life. . . . With rounded corners, smooth surfaces, and the minimum of projections. . . . Improved burners. . . . All connections concealed but accessible. . . . Stand provided with anti-rocking device. . . . Supplied with hinged cover, or, alternatively, a choice of standard plate racks, or the "P.R. Hot Closet." . . . Dapple or Ivory and Black Enamel finishes are available.

Some of its Features:

HOTPLATE HOB—Cast in one piece, it may be lifted off for cleaning the burners.

GRILLER—A new rapid heating-up and grilling appliance. Ready for use in one minute, it will toast bread at the rate of one side every 45 seconds.

CROWNPLATE — "Dished" to hold spilt liquids, it has no projecting trough.

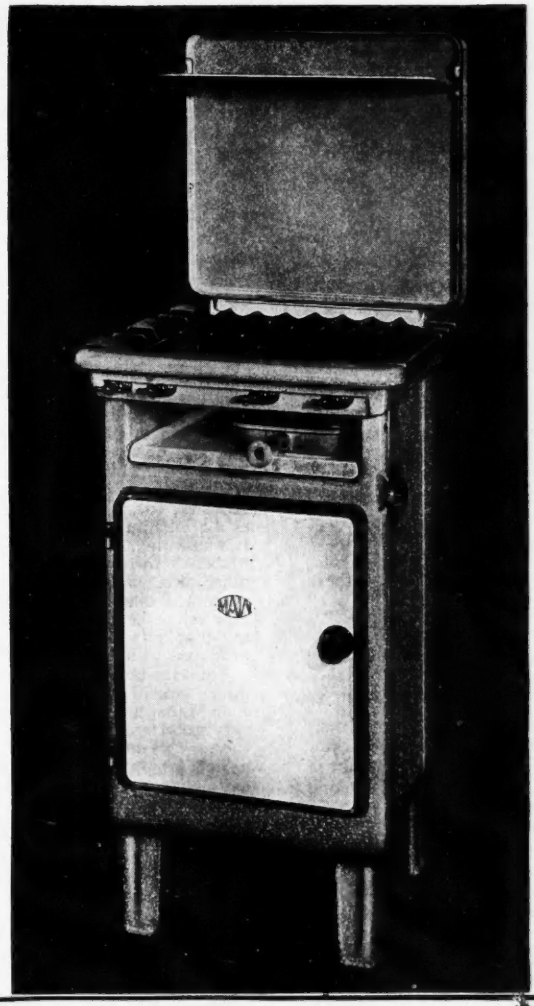
OVEN DOOR—Covers nearly the whole front, has small-size hinges, and embodies in one arrangement both a push-to latch and a positive tightening device.

OVEN FURNITURE—Three grid shelves, offset and reversible to give alternative positions, are supported by runners stamped on the enamelled linings. The drip tin sits on a movable base-plate which can be lowered to provide a "cool zone."

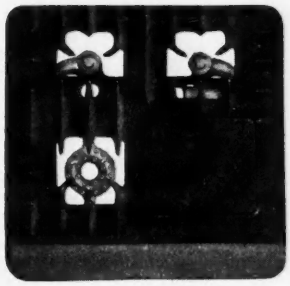
BRASSWORK—All taps are of hot-stamped brass with spring loaded plugs. The taps do not project beyond the front cornice.

GAS CONNECTION—This is hidden by the hob. The oven supply-pipe is completely concealed.

Write for further details or, better still, order a sample Cooker for test.



One of the alternatives to the Hinged Cover: The Stamped Enamelled Double Plate Rack with Enamelled Back-plate.



The Hotplate, showing an arrangement of 2 "Ace" and 1 Ring type Boiling Burners, and the removable cover plate protecting the Griller. Ring type burners instead of "Ace" type can be supplied if preferred.

R. & A. MAIN LIMITED, LONDON AND FALKIRK

special features which may have been introduced since the previous lighting season, also the correct regulation and adjustment of the various burners, correct fitting of glassware, &c.

In addition the cost of lighting by gas as compared with the cost of electricity is gone into and the various advantages of gas lighting generally, including freedom from eye strain, ventilation of the room, and its special advantage of providing quite a reasonable amount of heat during cold winter months, all important selling points.

In a further effort to improve the efficiency and extend the number of gas lighting points a policy was adopted in 1930 whereby slot consumers were enabled to purchase gas burners, gas fittings, and small gas appliances out of slot meter rebate monies.

In the first year 98 consumers took advantage of this offer with a cash value of £56. During 1938 approximately 3,000 consumers took advantage of this offer, the value of the fittings sold being just over £900. As some indication of the progress (not loss) that has been made in gas lighting by the Department I submit the following figures:

—	Number of Consumers.	Number of Domestic Gas Lit Burners in Use.
January, 1931	8,217	19,500
January, 1939	10,101	27,563
Increase	1,884	8,063

That the Gas Department's policy in fighting for the retention and extension of gas lighting business has been of material advantage is proved by the fact that notwithstanding the large amount of unemployment from which the district has suffered during the past 12 years, the average consumption of gas per domestic consumer has increased from 1926 by over 1,000 cu.ft. per annum, and despite the fact that out of the total increase in consumers between 1926 and 1938—namely, 2,643, more than half of these are represented by houses of the £450 and over class, where electric lighting was installed by the builder.

Turning to the second section of my contribution—namely, "General Appliances," I have taken these roughly to include such appliances as boiling rings, curling tongs, gas pokers, gas irons, and refrigerators.

With the exception of refrigerators, the Department's policy in the selling of other appliances has been very similar to the policy adopted for gas lighting—namely, to seek the co-operation of the distribution and maintenance staff in pushing the sales of these appliances wherever possible, to extend the same facilities to slot consumers to purchase out of slot meter rebate monies in the same way as gas burners and gas fittings, and to keep the advantages of these small appliances well before the public by advertisement and showroom displays.

In addition gas irons fall within the list of appliances which carries staff commission.

The following figures represent business turnover in these appliances:

	1932/1938.
Gas irons	920
Boiling rings	538
Other small appliances	1,938
Gas pokers, curling tongs, and gas pistols	129

Dealing with refrigerators, I am afraid that the Department has not met with the measure of success that has been obtained by other undertakings, more particularly those operating in the Southern Counties of England. For one thing the majority of our population comprises colliers, manual workers, skilled workers, and overmen in the various steel and tinplate works, and only a very few of the management and professional classes. The opportunity therefore to further sales of refrigerators, which are expensive, and in spite of the amount of advertising carried out, still considered a luxury, has been rather poor.

In addition to the various points which I have endeavoured to make as representing the general policy of my Department, there is one important feature which I must make—namely, the manner in which we are endeavouring to educate the rising female generation to appreciate all that can be done by gas. In this respect each of the school domestic science centres in the district have been equipped by the Department free of charge with the very latest types of cooking and hot water equipment, together with from two to six gas irons, according to the number of pupils.

Furthermore, both the Neath Clinic and the Neath Rural District Council Clinic have been equipped with Radiation clinical gas lamps, four lamps in all, and as both the Medical Officers of Health are keenly appreciative of the wonderful work which can be done by these lamps, and as a result of which the lamps are in regular daily use, this also helps to keep the good name of "Gas" before the public.

Conference Luncheon.

Subsequently the members of Conference were entertained at an official luncheon under the chairmanship of Lord Kennet.

In proposing the toast of the Guests, the CHAIRMAN greeted the members of the Fair Management Committee, members of the National Joint Industrial Council, and those associated with the 100,000 human souls who got their living from the Gas Industry. He was particularly pleased to see Mr. Will Thorne, M.P., present. They also greeted members of the Birmingham Corporation and especially the "Father" of the Corporation, Ald. Lloyd. He also welcomed delegations from many countries, and in particular representatives from Italy, Germany, and France.

Sir WILLIAM LARKE, responding, said that co-operation in the Gas Industry was a standing example to industry as a whole. He was informed that in Birmingham, as a result of developments, an annual reduction in atmospheric pollution of 30,000 tons of soot and 9,000 tons of sulphuric acid had been achieved. He must suggest that electricity probably made some contribution, but how much he would leave each to determine in his own way.

Guests of Birmingham Chamber of Commerce and Fair Management Committee.

Following the Conference on Wednesday morning the members were entertained at luncheon at the invitation of the Birmingham Chamber of Commerce and the Fair Management Committee.

Mr. W. L. CHANCE (Past-President of the Chamber of Commerce) proposed the toast of "The Gas Industry." He expressed appreciation of the sustained and loyal support which had been received from the Gas Industry at the Fair and hoped that that support would be continued in the future.

Mr. R. ROBERTSON (President of The Institution of Gas Engineers) responding, said the Fair, with its wonderful collection of exhibits and its fine examples of workmanship, was at once a tonic for all who had the country's industrial interests at heart, and it was an antidote for those afflicted with the "jitterbug," who imagined that the country was on the down grade. They congratulated the Fair Management Committee on another notable achievement. In a way Birmingham was the home of the Gas Industry, for it was in this locality that the possibilities of gas as an illuminant were first demonstrated on a practical scale. It was fitting, therefore, that a hundred years after the death of Murdoch there should be a demonstration of its possibilities in other directions, although the whole of the Fair would be inadequate for that purpose. On the other hand, the whole of the Fair might be regarded as a gas exhibit, for it would be safe to say that only a very small percentage of the exhibits had been produced without the aid of gas at some stage or another.

The Gas Section, however, was a token of a few of the more direct uses of gas and was not unworthy of the setting that the Fair Management Committee had provided, and it presented some very good examples of the services being rendered by the Gas Industry whether heat, light, or power was required. It also furnished examples of the very high standard of efficiency, design, and workmanship that had been achieved. The Gas Industry continued to grow, and it was worthy of note that at the present time the Industry was processing and distributing 10% of the total coal used in the United Kingdom. The smokeless fuel they distributed as gas and coke actually represented five times the energy distributed by the whole of the electrical industry.

But besides the services thus rendered in the domestic and industrial spheres, the Industry was rendering a national service in connexion with the conservation of coal and the elimination of smoke. There were also great possibilities for service in time of emergency—for the production of munitions and the supply of home made fuel for transport purposes. These were very considerable, but their main interest were in the time of peace in contributing to the amenities and the convenience of life in the elimination of drudgery in the home and of smoke from the atmosphere.

INDUSTRIAL USES OF
Gas in Wolverhampton

by
F. A. REYNOLDS,
Assistant Fittings Superintendent, Wolverhampton Gas Company.

From a Paper to the Midland Junior Gas Association on Feb. 2.

In presenting this Paper I am endeavouring to give you my personal experiences while developing the industrial load at Wolverhampton. I have only touched the fringe of industrial gas work there. I have attempted to give you details of jobs which I think are of special interest rather than deal with standard installations.

[The Author explained how he was appointed to the position and gave some of his experiences during the period 1930-34.]

By 1934 (the Author continued) I had gained considerable experience in the industrial uses of gas and found that it was only necessary to call in the advice of the Birmingham Gas Department on special jobs. One such special occasion was what I term our first big job, and it was for gas for forging and stamping at a works making edge-tools. Oil fuel was in use together with producer gas made in their own plant. The primary cause of their wanting to change over to gas was the fact that their producer gas plant was giving them trouble, and when we offered them a specially low price for a load of not less than 50 million cu.ft. per annum it was to their advantage to change the whole of the works over to gas. We had, however, to prove to them that gas would do the work satisfactorily and as cheaply as their present fuels. In September, 1934, therefore, arrangements were made to conduct a series of experiments with the object of ascertaining the quality and cost of the work done in gas-fired furnaces. The first job we were given was, of course, the most difficult, a process called "mould steeling." The moulds or billets from which the hoes were hammered out varied in size and shape, but the size mostly used for "mould steeling" was about 6 in. by 3 in. by ½ in. thick. One end only was inserted in the furnace and on this end was placed a small tapered piece of steel of higher carbon content. The mould and tapered piece were raised to welding temperature and welded together with automatic hammers. The idea was that when the mould was hammered out into the blade of the hoe, the front being in harder state after heat treatment than the back, the blade when in use always remained sharp. It is easy to realize then that the weld must be a perfect one to stand up under the hammering-out process.

During the War gas was in use here for forging, &c., and the pipelines were utilized for producer gas when they installed their own plant. We proposed to use these pipelines for our experiments and we counted ourselves fortunate that we had not to install new gas supplies. How mistaken we were you shall see later.

At the end of September the first furnace was completed to our design (fig. 1) and dried out, and on Oct. 1 the first

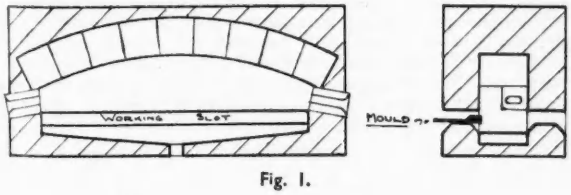


Fig. 1.

test was made. It was a complete failure. After only a short time running the gas supply became less and less and we eventually found that dirt deposited in the old supply pipes we were using was being carried forward and into the gas injectors. It was obvious also from this first test that the furnace was not suitable for mould steeling, and it was altered in the following manner: A centre wall was built partially isolating each side, the angle of the burner bricks altered to horizontal, and the upper front wall bevelled inside to throw heat on to the mould (fig. 2). The furnace was

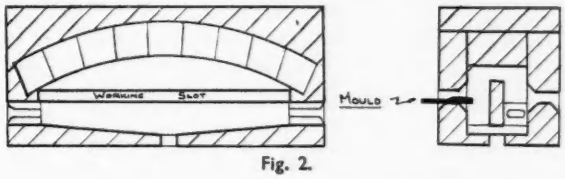


Fig. 2.

lit up and reached a temperature of 1,400° C. in 2 hours with a gas rate of 1,680 cu.ft. per hour. It was decided to try out under working conditions. However, when we did try out under working conditions we again met trouble, the gas rate having decreased to only 1,320 cu.ft. per hour. Work was attempted, but the furnace proved too slow. We learnt, however, that the furnace was too even in temperature, due to burners at each end. The ideal temperatures required were 1,400°-1,450° C. at end nearest hammer, tapering down to about 1,250° C. at preheat end. Benefiting by this information a new furnace was built (fig. 3), and being

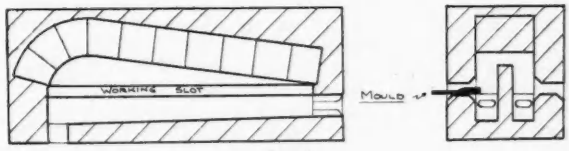


Fig. 3.

still short of gas we traced the old pipelines and found a syphon from which we eventually pumped about 10 gallons of thick tarry matter deposited there by the producer gas formerly used.

On Oct. 12 a test was attempted, but again the furnace proved too slow and in addition the quality of the work was poor. The air pressure to the burners was next investigated and found to be 1¾ lb. per sq.in. This we decided was not enough, and a separate blower was installed. The improvement was slight, the furnace being still too slow. By then I was getting a little disheartened and had it not been for the help and advice received from a member of the Furnace Section of the Birmingham Industrial Research Laboratory I am afraid the job would have been a failure. His optimism, patience, and wide experience were a great help to me and spurred me on to fresh efforts. By Oct. 24 the fourth and last experimental furnace was built (fig. 4). All recognized

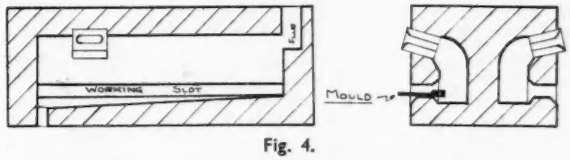


Fig. 4.

ideas had been abandoned, and we aimed at getting more flame contact. The next two days were spent in testing out this furnace which was decidedly our best effort yet, and on Nov. 1 the first complete test was made. The furnace was

slightly on the slow side (found later to be due to more dirt in injector) but the work done was good and the cost fairly low. It was decided straight away to build a furnace upon the same lines for heating the moulds for "stamping" or hammering-out the blades. From Nov. 5-22, 15 full days, tests were made on this stamping furnace with good results. "Mould steeling" was also well tested, and although everything proved very satisfactory gas was never adopted for this process, due to the lack of demand for the type of tool it produced. On Dec. 5 our tests were completed and it was left to our clients to make their decisions. Gas was adopted throughout the whole works for stamping and hardening and tempering, and from Jan. 1, 1935, to December, 1936, over 71 million cu.ft. was used. In 1937, however, this firm changed over to automatic stokers firing with cheap slack, and we were informed that their costs were reduced considerably, the firm not being particularly interested in working conditions.

During this very worrying, but very interesting and as shown at the end very satisfactory, test period, the other routine work had not been neglected in any way, and we had now gained the confidence of all our consumers, who did not hesitate to ask for help and advice.

One instance of note was a firm making spring washers. Hardening and tempering were done by means of electric furnaces, and although I must admit the quality of the work done was excellent the maintenance costs of the electrical equipment were enormous. This firm has now installed three large gas-fired furnaces and a gas-fired air tempering oven, all electrical equipment having been removed.

It was about this time that our first central heating boiler was installed, apart from small isolated jobs. The boiler was a Vesta Autocontrol No. B.L., and, apart from condensation trouble in the flue at first, it has been very satisfactory.

No special cheap rate of gas was offered for central heating at this time, and it was very difficult to sell gas for this purpose at a charge of 6½d. per therm. At a later date we were able to offer gas at 4d. per therm for central heating, which enabled us considerably to increase our central heating load, but I shall refer to this subject again later in this Paper. Early in 1935 we were called in by, strangely enough, another firm making edge-tools. Now, although this firm were classed as edge-tool makers the quality and variety of their tools were very different from our other edge-tool clients who were now using gas. The fuels in use at the time were coal and slack, coke, town gas, and Mond gas, and the average cost per month was given us as follows:

	£	s.	d.
Coal and slack	260	0	0
Coke	43	10	0
Town gas	9	6	1
Mond gas	9	13	9
	£322	9	10

We were asked for an approximate estimate of the cost of this work using town gas. After taking an inventory of the whole work and basing our estimate upon a gas consumption of 4 cu.ft. per lb. of metal heated, our monthly cost came to £283. This showed a saving over their present fuels, and, numerous other advantages being taken into consideration, we made an offer to our clients to install a furnace complete with check meter and supplies to gain more accurate information. The job we were given as a test was the heating of moulds or billets varying in weight from 2½ lb. to 5½ lb. each. The whole of the mould was heated and from this one heat the eye of the hoe was punched out and cleared and the blade squeezed out and rolled. Our clients required an output of 150 dozen moulds per 9½ hours, which was approximately one every 16 seconds, and a furnace was designed and built by us to do this work (fig. 5). After drying out, a

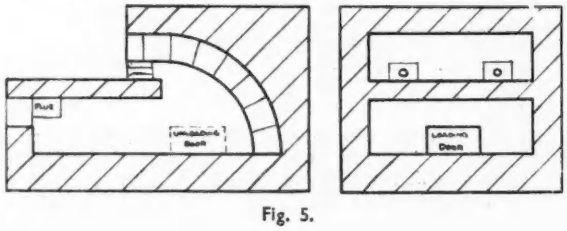


Fig. 5.

short test was done to ascertain the speed of the furnace. This turned out to be only 45 dozen in 9½ hours, with the gas consumption much too high. It was decided, however, to make a further test on lighter work, and although the consumption per lb. remained much above our estimate of 4 cu.ft., the estimated output rose to 77 dozen in 9½ hours. This gave us food for thought, and we decided to alter the furnace as follows: The combustion chamber was made 12 in. deeper and the preheat end 3 in. lower. Arrangements were made for heat to pass underneath the floor (fig. 6). A

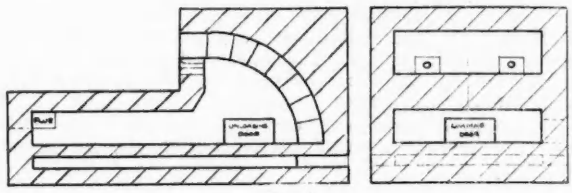


Fig. 6.

short test was made in this furnace, and with moulds weighing 4 lb. 3 oz. each we obtained an estimated output of 100 dozen in 9½ hours. A full day's test was therefore attempted and we obtained the following figures:

Duration of test	6 hr. 15 min.
Actual working time	3 „ 30 „
Total weight heated	1,219 lb.
Actual output	28 doz.
Estimated output for 9½ hours	98 „
Cu.ft. per lb. (total)	5·23
Cost per dozen	3·19d.

At this period our clients informed us that we were required to obtain as near as possible the following figures:

For 4½ lb. work 120 doz. per shift at 2·0d. per doz.
„ 3½ „ 150 „ „ „ 1·6d. „

We decided, therefore, to build a double-chambered furnace, as it was obvious the single chamber would not produce the output desired.

The next few days, therefore, were spent in designing and building a double-chambered furnace (fig. 7). The idea was

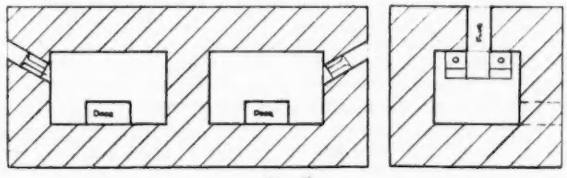


Fig. 7.

that while the moulds in one chamber were being worked a fresh batch would be heating up in the other chamber, and so a continuous supply of hot moulds would be available.

Before putting the furnace to work we raised one chamber to working temperature and put in 3 dozen moulds, each weighing 4 lb. 3 oz. These were ready for working in 17 minutes, the estimated output, therefore, being 95 dozen in 9½ hours. Further spot tests were done, using both chambers and obtaining similar estimated outputs, and we then decided that as spot tests were apt to be misleading we would attempt a half-day's test.

The following figures were obtained:

Duration of test	5 hr. 25 min.
Weight of mould	4 lb. 6 oz.
Total weight heated	1,759 lb.
Actual output	33½ doz.
Estimated output in 9½ hours	85 „
Cu.ft. per lb. (total)	6·0 „
Cost per dozen	4·4d.

These figures were, if anything, not so good as our previous test, and after careful consideration we altered the furnace in the following manner: The floor was raised 1 in. and the roof lowered 3 in., and the burner bricks moved to the front

of the furnace (fig. 8). It seemed obvious that we had too much combustion space.

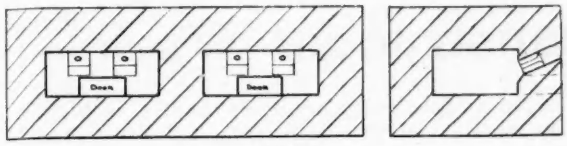


Fig. 8

A half-day's test was done on the altered furnace and the results were so promising that it was decided to do a full day's test. Here are the results:

Duration of test	11 hr. 25 min.
Actual working time (one hour being lost due to adjusting tools)	8 ,, 30
Weight of mould	3 lb. 2 oz.
Total weight heated	4,969 lb.
Actual output	132½ doz.
Estimated output in 9½ hours	148 ,,
Cu.ft. per lb. (total)	4·03
Cost per dozen	2·11d.

You will see now that we had practically achieved our objects which were, if you remember, 150 dozen output at the cost of 2·0d. per dozen, and the furnace was left for several days' working with different types of furnace men. I would like to emphasize that during these next few days the furnace was worked by the men entirely on their own, and during this period I purposely did not go near the works. The meter was read every day and the maximum output obtained was 136 dozen, the lowest cost was 1·83d. per dozen, and the maximum weight of metal heated in 9½ hours was 6,181 lb. The minimum cu.ft. per lb. of metal heated was 3·88 including heating period. Since then, however, as many as 200 dozen moulds have been worked from this type of furnace in 9½ hours.

After these results our clients decided to change over to gas, and up to date over 115 million cu.ft. has been used and our clients inform us that they are very satisfied with gas as a fuel, for, apart from fuel cost, the use of gas results in cleaner work, less scale, less scrap, reduced labour cost, and better production. It is interesting to note that we have endeavoured several times to improve on the double-chambered furnace with the object of cheapening production costs by reducing the cost of labour.

The design of the furnace and result of working is, I think, interesting.

The furnace consisted really of 6 furnaces or chambers in one. The chambers were each about 4 ft. long, 6 in. wide, and 3 in. high, and each was independently fired by air blast burners at the discharge end. The moulds were pushed through each chamber consecutively by a boy, and as the mould reached the discharge end it had been preheated and was taken out by the stamper at the hot end of the furnace at the correct temperature. Each chamber, of course, was always full of moulds, each one pushing the others up as it was inserted at the back end. The disadvantages of the furnace were these:

It was very difficult for the operator to obtain the same temperature in each chamber; consequently the loader had difficulty in telling from which chamber the stamper had taken a mould; the stamper would take a mould that was the hottest irrespective of rotation. Also, considerable trouble was experienced in the moulds sticking together, especially if the stamper had for some reason or other missed drawing from a chamber for a few seconds longer than he ought. It is quite possible that the failure of this furnace was more due to the men than anything else, as they could see that if the furnace proved successful someone would either be out of work or get a lower-paid job. We have since designed and built a furnace to heat the moulds on the conveyor principle, but although our part was successful the conveyor, built by our clients, was a failure.

Towards the end of 1936 we turned our attention to the use of gas for central heating. A special rate of gas at 4d. per therm was offered and since then our central heating load has increased over 400%.

Numerous Richard installations have been supplied and fitted by ourselves, but our policy is to work in conjunction with the heating engineers whenever possible. In addition to space heating by means of boilers and radiators we have installed various systems, including unit heaters of the convector type, high-pressure radiant heaters, and low-pressure radiant heaters. We have also converted solid fuel boilers to gas by means of special conversion sets with successful results. It is perhaps interesting to note that we at Wolverhampton were, I think, the first to develop the Richard system of gas-fired central heating in this country.

A little trouble was experienced at first due to corrosion inside the heater, but since the patents have been taken over by a well-known Midland firm all troubles have been eliminated. In our opinion the heater is now an excellent job in every way.

Having made several business visits to Watson House, it was suggested that we take a party of our industrial consumers there, so that they could see for themselves the work that was being done to make gas apparatus more efficient. Our cordial relations with our industrial consumer were enhanced more so, and already quite a number of definite enquiries have materialized. One such enquiry has developed into a gas consumption of about 40 million cu.ft. per annum, and we are engaged at present in laying a special 12-in. main to the works in question. We are informed that it is quite probable that in about six months' time the gas consumption at this works may reach 80 millions per annum.

Discussion.

Mr. A. W. Attwood (President) said the subject had been made more interesting because Mr. Reynolds had not hesitated to discuss the various troubles that had been experienced. He stressed the importance of having someone upon the staff who specialized in the type of work carried out by Mr. Reynolds.

In proposing a vote of thanks to the Author, **Mr. G. E. Stevenson** (Long Eaton) said the Paper indicated the enterprise shown by the Wolverhampton Gas Company in their efforts to increase the sale of gas for industrial purposes.

The vote was seconded by **Mr. F. J. Bengough** (Birmingham), who said it was very encouraging to the Junior Association to find that a junior who had started in the laboratory had been able to take up the work of developing an industrial load and been able to produce such wonderful results. He asked if any complaints had been received regarding radiant heaters due to sulphur fumes or damage to decorations, and he said he considered that this method of heating should be an incentive to gas undertakings completely to remove the sulphur from the gas.

Mr. Reynolds, in reply, said that no complaints of this nature had been received.

Mr. S. Brockbank (Walsall) also commented upon the value of receiving particulars of troubles experienced.

Mr. F. A. C. Pykett (Coventry) considered that if gas for central heating was offered at a special price, then it should also apply to gas used for other forms of heating, such as gas fires. For instance, in respect of a building for which a special price had been quoted for central heating, he did not see why a concession in price should not be made if it were agreed, say, that a gas fire would be fitted in every office in the block. He referred also to the advantage of fitting governors on plant, a practice which was strongly recommended in Coventry.

Mr. Reynolds agreed as to the advantage of fixing governors. In Wolverhampton, he added, special prices were quoted for space heating, but in such instances consumers had to use a specified amount per annum.

Midland Juniors Visit British Oxygen Company, Ltd.

On Feb. 9 a party of about thirty-five members of the Midland Junior Gas Association visited the Wolverhampton Works of the British Oxygen Company, Ltd., to inspect a plant for the manufacture of oxygen, which this firm market for various purposes, but largely in connexion with welding processes.

The plant is of modern design and the members were taken through the various stages of production by the guides, who went to considerable trouble to make a rather difficult process easily understandable.

The visit was thoroughly enjoyable, and at the conclusion the President (Mr. A. W. Attwood) thanked the British Oxygen Company for the invitation, which had been much appreciated. Thanks was also extended to the guides who had conducted the parties over the plant.

The Operation of a Reconstructed Works

by

R. T. DE GRUCHY,

of the Gas Light and Coke Company, Gas-Works, Southend.

From a Paper to the Southern Association of Gas Engineers and Managers (Eastern District) on Jan. 25.

Until 1932, when the Southend Gas Company was acquired by the Gas Light and Coke Company, the proportions of coal gas and carburetted water gas were so adjusted in manufacture that practically the whole production of coke was utilized in making water gas, which therefore constituted a very high proportion—60 or 70%—of the gas sent out.

The manufacturing plant in use at that time consisted of a horizontal retort house of about 2 million cu.ft. per day capacity, and a carburetted water gas plant, comprizing 3 sets with a total capacity of 3½ million cu.ft. During the succeeding years a market for coke was built up locally; the yearly increases in the sale of coke being illustrated by the following figures:

	Tons Sold.
1932	2,040
1933	5,179
1934	10,640
1935	13,888
1936	12,893
1937	21,712

The trend of the figures, after a few years, showed that the capacity of the retort house, which was then approaching the age when very considerable reconstruction, if not rebuilding, would be necessary, would shortly become insufficient to supply the needs of the local coke market, so it was decided to build a new house of greatly increased capacity. The plant decided on was a unit of Glover-West continuous vertical retorts, of 4 million cu.ft. per day nominal capacity, making gas of a suitable calorific value for the district—*i.e.*, 500 B.Th.U.—and carbonizing Durham run-of-mine coal. Early in 1935, therefore, work was begun on the foundations of the new house, which consisted of 68 40-in. retorts each of 4 tons per day throughput, arranged in rows of 4 and divided into 5 beds of 12 and one of 8. The retorts are rated for a production of 4 million cu.ft. per day with 64 working and 4 scurfing. This output is sufficient to supply the needs of the district at all times except those of peak loads due to unusually severe weather; hence it is necessary only at rare intervals to supplement the normal coal gas make with carburetted water gas.

The settings are heated by 8 open fronted step grate producers connected to a common producer gas flue. It is found necessary for the proper working of the producers to use coke with fines screened out, and the fires are cleared at 12 hourly intervals. Eight hour cleaning has been tried, but the longer interval gives a better quality producer gas, and variations in production from the individual fires are largely smoothed out in the common flue. In addition to the main supply of producer gas an auxiliary supply enters each chamber between the 2nd and 3rd retorts, each being individually adjustable by means of interchangeable nostril plugs with a range of orifices of varying size. These have a tapered fit, and although readily changeable are usually left in position for long periods, while day to day adjustments are carried out by the use of the main producer gas and control dampers. Similarly, the secondary air is supplied to each chamber in two stages.

An Unusual Feature.

An unusual feature of the setting is that the secondary air, entering on the non-producer side, passes twice across the setting before entering the uptakes. This serves the double purpose of preheating the air, and cooking the coke before it reaches the bottom castings, and was incorporated in the design to facilitate the making of high quality gas for benzole extraction. This would necessarily involve reducing the retort steam to an amount much below that normally required, with consequent risk of overheating the bottom castings, a point which is dealt with later. Readings of the secondary air temperature show that, entering at 90° C., it reaches 220° C. at the end of the first flue, and 500° C. at the base of the uptakes.

There are 5 combustion chambers proper, and 5 circulators, though Nos. 6 and 7, the lowest two of the latter, have supplementary supplies of gas and air to give added heat to the upper parts of the retort. There is also a by-pass from the producer gas uptake to the waste gas flue leaving the setting in order to increase the supply of heat to the waste heat boilers if required. Heating of the retorts, judged even by the standards ordinarily applied to new work of this type, is unusually even and allows good throughputs to be obtained at moderate temperatures. In the ordinary way of working the general level of heats is altered from time to time, but the following are average temperatures (excluding scurfers) over a period of 4 weeks when the throughput was steady at about 3·8 tons per retort per day:

Combustion chambers	5	1,245°	Circulators	10	965°
	4	1,260°		9	1,050°
	3	1,275°		8	1,075°
	2	1,290°		7	1,170°
	1	1,260°		6	1,200°

Temperatures Fairly Uniform.

Comparing retorts in the same row of four, temperatures from front to back of the setting are fairly uniform, with a tendency for retorts 3 and 4, numbered from the producer side to be slightly hotter than 1 and 2. However, this difference is not sufficiently great to warrant attempts being made to eliminate it, and it can be said that the more common feature of the retorts nearer the producer being the hottest has been overcome in this case.

Since carburetted water gas is only used for meeting peak loads, variations in load have to be allowed for in the operation of the retort house. Owing to Southend's well-known attraction as a holiday resort, the seasonal difference is not as great as in most places, and the Sunday load is generally a little higher than the week day. The July consumption, for example, is about 75% of that for January, and this summer decrease is met by dropping a bed of 12 retorts for about six months of the year. In addition to this, heats can be raised or lowered, within limits, at about 2 days' notice, while day-to-day adjustments of output are made by varying the number of retorts scurfing. This method of working is less economical, as regards both labour and fuel, than would be the case were the load constant, but these losses are outweighed by the saving in not running the C.W.G. plant, at any rate while the coke market remains firm. An added advantage is that the district gas is of unusually constant composition and gravity, and in this connexion it may be noted that when in March, 1937, the proportion of C.W.G. was suddenly dropped from 50% to nil, no complaints from the district resulted.

Scurfing.

In scurfing, which is done in units of 4 retorts, damper openings are reduced at the same time as the coal slides are closed. When the retorts are empty admission of steam is increased somewhat and air is admitted with caution until it no longer tends to generate excessive temperature in the retort.

As scurfing proceeds the amount of steam is reduced, and after about 48 hours the dampers are returned to working position. This maintains a reasonably constant retort temperature until the process is finished, usually a matter of about 3 days. The objectives kept in mind while scurfing are to prevent a big difference of temperature between the

edge of the scurf and the retort wall, and not to allow the top casting to become excessively hot. This control can be obtained, to some degree, by striking a balance between the exothermic reaction of scurf and air (*i.e.*, carbon and oxygen) and the endothermic one of carbon and steam.

At the present age of the settings, about 700 days, the retorts appear to be almost free from leakage. This feature is confirmed by the low production of steam on the waste heat boilers; and the few open joints which have been found are only in evidence after scurfing. A certain amount of spalling has taken place in the middle zone of the retort, but has not reached serious proportions.

Heating Up.

The use of a common producer gas main has one feature which cannot be disregarded. When an additional setting is required to be heated from cold, the usual method of drying out with warm waste gases from a small fire in the producer cannot be employed, and heating has to be done from the start with producer gas. This necessitates great care being taken, as a small volume of gas at high temperature is a more drastic heating medium than a much larger volume at a lower temperature. In the light of experience gained in the heating up of single beds on two or three occasions slight modifications have been made in the method used, which is now as follows:

Coal gas flares are inserted at the bottom of each producer gas uptake and after 24 hours the producer gas dampers are opened until a flame of producer gas about a foot high is visible; danger of these flames being extinguished is prevented by the coal gas flares. The two bottom rows of nostril plugs are removed, since the lowest chambers are apt to be starved, and the lower rows of sight plugs on the opposite side are clayed up to prevent infiltration of cold air where the inside of the settings is under vacuum conditions. The upper plugs on the producer gas uptakes are also clayed up, but the second row up are left out so long as no pressure is shown there. A few long thermometers are inserted through the sight holes to check the temperatures in the chambers, and while these increase steadily the admission of producer gas is left unaltered; but after two or three days it becomes necessary to open further the gas dampers. In the early stages of heating the waste products find their way out of the setting without any special provision being made, but as the volume increases, small outlets to atmosphere are made over the control dampers, of such a size that conditions are maintained with level gauge approximately halfway up the setting.

This phase of heating can be continued until the temperature of the uptakes reaches the maximum considered desirable, by which time gaseous firing can safely be commenced, 7 or 8 days from the beginning. To change over it is merely necessary to replace all plugs on the producer uptakes and open the gas dampers until all chambers are being fed; at the same time the secondary air slides may be opened slightly. The remainder of the heating up process is on normal lines. The principal difficulty, it has been found, is to draw the hot gases through the lowest combustion chambers during the early, and, where the expansion of silica is concerned, critical, stages, and this is the point to which most attention is given in trying to induce monolithic expansion through the whole bulk of the setting.

Benzole Extraction.

As mentioned earlier, the carbonizing plant was designed with a view to making high quality gas to allow of extraction of benzole. As a plant for this purpose is shortly to be installed, it was thought advisable to test the performance of the retorts under these conditions, and in 1937 a two weeks' test was carried out under the control of West's Gas Improvement Company to see whether a quality of 540 B.Th.U. could be maintained without any ill-effects. The results of the test are shortly summarized below:

—	1st.	2nd.	Normal Work.
C.V.	542	541	501·6
Therms per ton	69·5	74·9	81·9
Make per ton	12,830	13,840	16,340
Throughput per retort per day, tons	4·33	4·10	3·97
% steam	3·2	5·0	9·6

During the test the temperature of the bottom castings was kept under observation, and measurement was made both of these and the supporting steelwork, using a thermocouple adapted for surface use. The maximum temperatures recorded were 440° and 370° respectively for castings and steel work, and these were not high enough to occasion any alarm on the score of distortion or sagging of the steel cross joists. For the rest the fact that the plant would work satisfactorily making gas of 540 B.Th.U. quality, thus giving a margin of 10 B.Th.U. over the anticipated working requirement of 530 B.Th.U., shows that it should be possible to make gas of this quality easily and consistently.

Oil Washing Plant.

The extraction of benzole is to be done by an oil washing plant similar to the one at the Company's Kensal Green Station, using a high oil circulation, and distillation under vacuum to increase the extraction efficiency, and partially to remove the organic sulphur compounds. The oil distillation will be adjusted to remove about 3 gallons of benzole per ton of coal carbonized, though adsorption tests with activated carbon have shown the benzole content to be slightly above 4 gallons per ton.

As there is a good coke market in Southend, it is proposed to continue making 100% coal gas, in which case some changes in carbonizing results are to be expected, and these are estimated below:

Results per Ton of Coal Making 500 and 530 B.Th.U. Gas Respectively.

—	500 B.Th.U.	530 B.Th.U.
Therms per ton	82	76
Cu.ft. per ton	16,400	14,330
Fuel % of coal	15	14·5
Coke and breeze for sale	11·2 cwt.	11·6 cwt.
Process steam	210 lb.	140 lb.

In explanation of the above figures, it is to be expected that an improvement in the fuel figure will be obtained owing to the lower steaming and bigger throughput of coal; in this connexion a fuel figure of 13% has been shown under test with the house on full load, hence the improvement might be greater than the 0·5% above. The higher yield of coke and breeze for sale (including fuel to boilers) results partly from the economizing of fuel and partly from the reduced consumption of coke in the retort in the production of water gas. Data for the estimated figures have largely been obtained from the Paper "Steaming in Continuous Vertical Retorts," by Barash and Tomlinson.

On the basis of the above figures, the quantities involved in a year's working will be as follows:

Annual Make of 1,100 Million Cu.Ft.

—	Without Benzole Extraction.	With Benzole Extraction.	Percentage Increase.
Coal carbonized	67,200 tons	76,800 tons	14·2
Coke and breeze for sale	37,600 ,,	44,500 ,,	18·3
Tar made at 11 galls./ton	739,000 gall.	845,000 gall.	14·2
Benzole at 3 galls./ton	—	230,300 ,,	—

Allowing for a slightly higher throughput of coal in the retorts when making the higher quality gas—say, 4·2 tons instead of 4·0—the maximum day's output, with 64 retorts working, will fall from about 4·2 to 3·85 millions; this will increase slightly the probability of having to put up the C.W.G. plant to meet peak loads. In the particular case of Southend the increase in labour cost for process and maintenance work on account of the extra tonnage handled should be comparatively small.

The reduction of the above figures to terms of money has not been attempted, as in a case like this, where the profitability of a process depends the ratio of coal and coke prices at the works, any direct comparison between one works and another is likely to be misleading.

The question of whether the extra coke produced will not have to be disposed of at a lower price has to be considered; up to date, however, the local market has been expanding, particularly on account of the number of new open fires installed, for which the coke is particularly suitable, and the indications are that the extra production will be absorbed locally. An unpredictable factor is competition from by-product oven coke, since freedom from this is dependent on the continued activity of the steel industry.

The Modern Domestic Field

From a Paper to the Scottish Junior Gas Association (Western District), Feb. 11.

by
D. BEAVIS,
of Helensburgh.

The nature of the area of supply of the Helensburgh Town Council Gas Department may be described as entirely residential. All development of the use of gas must therefore be in the domestic field.

Like most supply areas, we have been subject to an ever-increasing electrical competition during the past several years. Despite the offer of lighting fittings and switches at subsidized prices, there is a gradual but steady change-over to electricity for lighting purposes. It has been averred again and again that the loss of the lighting load can only lead to the loss of other business by the gas suppliers; that once a property is wired for electricity the adoption of the latter for other purposes will soon follow. Complete disagreement with this opinion is expressed. It is found that after the change-over of the lighting medium gas is still employed for the other domestic purposes; indeed, in not a few cases the change-over is accompanied by new business for the gas undertaking, as many people decide that they will have their gas installations brought up-to-date at the same time. Particularly does this obtain where the alterations accompany a change of tenancy.

Table 1 shows gas consumptions per meter per annum for both ordinary and slot meters during the past five years, and all consumptions other than domestic have been excluded from the statistics given. The figures reveal that the consumption per consumer is steadily rising, despite the fact that its value was already in 1934 very much above average, and these statistics are put forward in support of the opinion that to defend the lighting load by a material subsidy is not worth while.

TABLE 1.

Gas for Domestic Purposes.

	Ordinary Meters.			Prepayment Meters.			Combined.		
Year.	No. of Meters.	Total Consumption.	Consumption per Meter.	No. of Meters.	Total Consumption.	Consumption per Meter.	No. of Meters.	Total Consumption.	Consumption per Meter.
1933–34	1,928	113,932,000	59,093	1,381	42,645,000	30,880	3,309	156,577,000	47,319
1934–35	1,908	117,490,000	61,578	1,403	44,195,000	31,500	3,311	161,685,000	48,833
1935–36	1,910	120,732,000	63,210	1,476	45,917,000	31,109	3,386	166,649,000	49,217
1936–37	1,903	123,615,000	64,958	1,447	47,262,000	32,662	3,350	170,877,000	51,008
1937–38	1,900	129,027,000	67,909	1,495	48,324,000	32,324	3,395	177,351,000	52,239

The public to-day no longer subscribe to the idea that the newer commodity must on that account be the more effective. Rather are they concerned to know which will best satisfy their requirements; and the expression by the representatives of the Gas Industry of fair and unbiassed views will earn the goodwill of the consumer and result in more satisfactory business than all the high pressure sales talks in the world. It must therefore be the duty and constant aim of all employed in the business of the Gas Industry, whether manufacturers or suppliers, to ensure that gas remains the most economical and satisfactory fuel for all other domestic purposes, and it is held that the money at present expended in defence of the lighting load, with its attendant high maintenance cost, would be better employed in the development of other domestic uses of gas.

Advertising Value of Showrooms.

Until a few years ago the showrooms at Helensburgh consisted of a converted house—it was the Manager's residence in the early days of the Undertaking. Early in 1937 showrooms with excellent facilities for display and demonstrations were completed. The advertising value of the new building cannot be over-emphasized. The demonstration hall, which was designed to accommodate about sixty persons, has proved most popular and attendances at demonstrations have on several occasions taxed the ingenuity of the staff in the provision of seating accommodation. A great asset of these demonstrations is the opportunity gained of showing the customers in the showrooms the many domestic requirements which can best be satisfied by the use of modern gas appliances, and, though a sale may not materialize for some time, the knowledge of the purposes for which gas may be employed will remain and, when the time comes, benefit consumer and supplier alike. It should also be said here that at no time is the consumer under pressure to buy. Guidance and advice are given in the selection of an appliance should one seem more suited to the requirements than another, but so long as the appliance is suitable for the conditions the matter of selection is left to the caller's choice. It is found that this method achieves excellent results and that a most friendly spirit exists between the undertaking and the consumers.

The past ten years have seen considerable modification and alteration in appliance construction. The old style of appliance was rough and ready and could in the ordinary way take endless abuse; the new style is a precision instrument scientifically designed and constructed. This evolution has been attended by several consequences. These might best be tabulated:

1. Increased efficiency.
2. Improved appearance.
3. Increase in number of types.
4. Greater complexity of the individual appliance.
5. Increased sensitivity.

The advantages embraced by the first three heads need no enlargement or explanation, as they are well known to all. The question of complexity gives rise to two difficulties—first, there are more possible sources of trouble; secondly, only too often the fitter does not understand the principles on which the appliance operates.

The first is a matter for the manufacturers, and a plea is made that all new gadgets or appliances embodying fundamental changes in design be thoroughly tested not only under laboratory conditions, but also under the conditions under which the appliance will be required to function. The gas undertakings cannot afford to install appliances which will prove unsatisfactory after a comparatively short period of use or which demand perpetual maintenance.

Training Fitters.

The education of fitters is a matter for the attention of the undertakings. The majority of fitters are at present recruited from the plumber ranks, and their apprenticeship cannot be held to be an ideal or even a moderately good training for employment in the Gas Industry. The makers kindly provide printed instruction cards with most appliances, but these, too often, are beyond the comprehension of the fitter, who, though he may connect up the appliance in a tidy manner, is quite unable to effect proper and scientific adjustment of the burners. And upon this depends the success or failure of almost all appliances, but in particular such appliances as instantaneous water heaters and refrigerators. In the case of other appliances faulty adjustment must still, however, lead at least to uneconomical running, if not imperfect combustion. It is further true, unfortunately, that

in the event of a defect developing in one of the more complicated appliances the fitter has little idea of how to locate it, though it may be well within his powers to remedy it once it is indicated to him. The fundamental difficulty would appear to be the lack of any form of technical knowledge, and the absence of appreciation of the phenomenon of combustion.

It is put forward as a suggestion that every fitter should be required to attend a training course where the functioning of standard forms of appliances and the underlying principles are explained. It is regrettable, however, that the small undertakings can do little by themselves, but co-operation of the undertakings in each district might enable the foundation of a small training centre which could be supported proportionately by the gas undertakings benefiting by it.

I do not develop the idea further, but now that fully automatic equipment with appliances is the rule and no longer the exception, I think the matter is worthy of consideration. I do say, however, that I think the Industry should engage its own apprentices and make sure that their training is adequate. Nothing can be done if the necessary intelligence is lacking in the first place, and much is to be gained in the careful selection of the new recruit.

Sensitivity of Appliances.

The fifth heading referred to the increased sensitivity of appliances. By this is meant sensitivity to the variations in the quality and nature of the gas supply, whether it is irregularity of pressure, calorific value, or specific gravity. All modern burners are designed to work at a specific pressure. To that end the manufacturers are incorporating pressure governors, or in some cases constant volume governors. This addition, though introduced with the very best of intentions, is perhaps a trifle unfortunate, as small diaphragm governors are prone to stiffness and stickiness after comparatively short periods of service. (The modern methods of thorough purification, benzole plants, and dry gas plants are not without their influence upon this.) The sovereign remedy rests in the standard of supply pressure, and undertakings, by systematic examination of mains and services and subsequent renewal where necessary, must make certain that the supply pressure at each meter conforms to this standard, and, what is more important, does not vary appreciably at one meter, though it may vary from meter to meter depending on the situation.

This point has been appreciated by modern gas undertakings for some time, and inadequate service must soon be an affair of the past. Given a constant supply pressure above that required by the appliance, perfect regulation can be effected by a restrictor eliminating the cost of supplying and maintaining individual governors for each appliance.

Burner Variation.

Appliances are now specified, and properly so, on the basis of thermal output. Since each appliance is designed to function at a specific pressure, the burner arrangement must vary with variation in the calorific value. Thus the manufacturers have to stock many burner arrangements to accommodate the many different calorific values throughout the country. This is surely unnecessary, and three, or at the most four, values—if the former 400, 450, 500 B.Th.U. cu.ft., if the latter 400, 433, 467, 500 B.Th.U. cu.ft.—should be ample. This would greatly simplify burner design, reduce appliance costs, and in general must be an advantage to all concerned. It is also worthy of note that variation of C.V. above standard can be just as harmful as variation below, and every effort should be made by undertakings to keep the quality of gas supplied uniform.

The third variable mentioned was specific gravity. Where coal gas only is supplied this factor may be assumed to be reasonably constant, but where carburetted water gas is employed to tide over peak loads it does not require a very high percentage to affect the Sp. Gr. materially and result in shortened flames and lower thermal outputs. About 25% should be recognized as a maximum proportion of carburetted water gas in the mixture where the undertaking normally supplies coal gas alone.

So far the factors discussed have been affecting the quality of the gas supply. In the case of the water heater, the water supply must be considered also; in particular with reference to the instantaneous water heater. Two considerations have led the writer to the belief that indiscriminate installation of these heaters in gravity water districts is undesirable. The reasons are, first, water pressure, secondly water temperature.

A multiplicity of most attractive flueless heaters and portable heaters can now be obtained. In a fashion this is unfortunate, as it is encouraging the neglect of insistence upon properly constructed flues in each room of the modern house. It is important to make known that the advantage of gas as a space heating medium reposes almost as much in its promotion of ventilation as in its radiant warmth. A chimney flue made up of breeze blocks can be built into the standard 9 in. brick wall and at the same time provide an outlet for fine breeze, a product which it is at the present time difficult to sell.

Sales of Coke.

As yet there is little use of coke for domestic purposes. The increased sale of coke is no less important than the increased sale of gas. There are many houses to-day whose main supply of hot water is from the "back boiler" fitted in a modern living room fireplace. The design of a fire setting of attractive lines suitable for this purpose and utilizing coke should not be difficult. The subsequent installation of these would provide a new and regular outlet for coke; and it is to be remembered that it is a smokeless fuel. To ensure the success of such installations thorough and accurate coke grading would be required.

To-day our principal difficulty in the domestic field is subsidizing service and installation costs from the revenue obtained from the sale of the commodity. This is making competition particularly difficult where new apparatus is concerned, since the builders are interested for the most part in installation costs and in installation costs only; the subsequent running costs are of no concern to them. It would appear, therefore, that if the Gas Industry is to be compelled to subsidize new installations the commodity rate must rise. This would be most unfair to existing consumers, since they, along with the new consumer, must bear the addition to the commodity rate. It is difficult to see how this matter is to be tackled, but at present it would seem that installation costs must be subsidized to the extent necessary to reduce them to a competitive figure. Otherwise the efficiency and prestige of the Undertaking will suffer by the loss of business.

Discussion.

Mr. Smith (Dumbarton) felt that domestic lighting would go, but that other appliances would be obtained in its place, since the installation of electric lighting reduced the heating of the house and additional space heating appliances would result. In Scotland the price of coal was such that domestic coke had little chance of capturing the market for house heating.

Mr. Bateman (Kilmarnock) said the wages offered to fitters were not of sufficient worth to attract the correct type of man to the Industry. His solution to the standardization of C.V. would be complete gasification, and to capture the domestic heating market the low-temperature carbonization product was the thing.

Mr. Greig (Glasgow) thought that subsidies were dangerous and that it would be better to use the money for the production of an economic commodity.

Mr. Nicol (Greenock) said that training classes should be set up and that undertakings should supply the appliances for study.

Mr. MacGregor (Greenock) was sure that gas lighting would "come again."

Mr. Sheath (Beith) thought that the fitters should be supplied with the literature that the managers usually got.

Mr. Shand (Falkirk) said all apprentices in Falkirk were supplied with text books and technical literature, and if they were ambitious they would find the necessary knowledge. The best salesman was a good gas fitter.

Mr. Sturrock (Greenock) said that the day was coming when all fitters would also be plumbers and be permitted to do all the necessary work on water heaters, &c.

Mr. Beavis replied to the points raised, and, on the call of **Mr. N. C. Sturrock**, was accorded a hearty vote of thanks.

Personal Experiences on a Small Gas-Works

by
H. K. LISTER, of Holmfirth.

From a Paper to the Yorkshire Junior Gas Association on Feb. 25.

The capital of this Company, to which I was appointed in 1927, was £5,000, but there was also a debt of well over £1,000, and no dividend had been paid for two years. The annual gas sale up to 1926 was 13¾ million cu.ft., and the price per 1,000 cu.ft. was 5s. During the 1926 coal strike the price was raised to 5s. 10d. per 1,000 cu.ft, a measure that aroused a considerable amount of resentment from the consumers, and the sales for the following year fell by 2 million cu.ft., which reduced the revenue from gas to the amount normally drawn before the advance in price took place.

The condition of the gas-works, as I found it, was not at all encouraging. The retort house had been built when the Company was formed in 1895, and no repairs appeared to have been carried out before my arrival; consequently the walls were in a very bad state, and the slated roof was in urgent need of repair.

The retort bench consisted of three beds of stop-ended retorts with six retorts in each bed. There were two direct fired furnaces and one of the generator type. The bench itself completely filled one-half of the retort house. The ends of the bench had been built against the side walls of the house, while the gable wall actually formed the back of the bench.

Formerly shorter retorts than the existing ones had been in use, but the introduction of those 10 ft. in length had resulted in the removal of the lining bricks at the rear end of each arch, except for a single brick lining 3 in. thick. The effect of the heat and of the expansion that had taken place after setting renewals had caused the foot of the gable to bulge out about a foot beyond its original position, while the upper half of the gable tended to go the other way.

Buckstays of an ancient cast-iron type were in the usual positions around the bench and were connected over the top by tie rods. What was unusual was that those at the back of the bench were on the outside of the retort house wall, while those in front of the bench were all fractured at the foot.

The irregular tee-shaped cross-section of the buckstays had made the fixing of brackets for mouthpiece stays a rather difficult matter, and these had therefore not been fitted.

Sagging Mouthpieces.

The mouthpieces on the direct fired settings were of the old limed lip type, and were light enough to function properly without other support than the retort bolts, but self-sealing mouthpieces had recently been fitted to the generator setting, and the extra weight of those, in the absence of stays, had caused fractures of the ends of the retorts that allowed the mouthpieces to sag forward. Small brick piers had been built under the bottom mouthpieces to prevent them dropping off altogether.

The introduction of small quantities of air into the mouthpiece of a retort from either badly fitting lids, or from the fractures of the retort near the mouthpiece, results in combustion taking place at the bottom of the ascension pipe, and is one of the chief causes of ascension pipe stoppages. When the lid is opened a red glow of burning pitch inside the gas offtake will be visible under those conditions.

This trouble was being experienced with all the ascension pipes of the generator setting. We therefore closed the fractures in the retort ends by jacking the mouthpieces back into their original positions, and sealed the places in question with Pyruma.

Later new buckstays formed by steel H girders were erected round the bench, and girders of the same type were used to brace them together over the top in place of the tie rods formerly used. This made it possible for cradles to be fitted to the cross girders to support the hydraulic main, which up to that time had been supported by cast-iron stands resting on the brickwork top of the bench over the division walls.

These stands, though now out of date, had served their purpose very well; no subsidence had taken place, and the main was level.

As there were no division plates in the hydraulic main, it was not possible to shut off the section over a bed that was not in use. A brick plug, therefore, was inserted at the bottom of each ascension pipe to prevent air being drawn in.

When a setting was pulled out for retort renewals it was usual to take the bridge pipe down at the same time as the ascension pipe and the dips were stopped with wood plugs.

The main flue ran along the top of the bench close against the back wall of the retort house. It consisted of two 9-in. walls, 15 in. high and 12 in. apart, with fireclay cover tiles, 3 in. in thickness, forming the top.

The brickwork of the flue was in a very bad state, and most of the cover tiles were fractured. Therefore it became necessary for the flue to be rebuilt, and this had to be done with settings No. 1 and No. 3 working.

We removed the cover tile from the main flue over the damper of setting No. 3, and placed a 12 ft. long, 8 in. diameter cast-iron pipe vertically over the damper, and used this for the chimney while the flue was rebuilt over settings 2 and 3. Finally setting No. 1 was dampered down for the few hours needed to renew that portion of the flue adjoining the works chimney.

As there had previously been trouble with broken dampers obstructing the damper openings, I took the opportunity that occurred by the rebuilding of the main flue to have special cover tiles fitted over each damper, each with a loose square sight plug, similar to the combustion chamber sight plugs. The damper opening could then be observed without the difficult task of raising the cover tile.

When I went, later, to the Holmfirth Gas-Works I found several of the retorts unaccountably damaged, particularly the stopped ends, which in each case appeared to have received a blow with something resembling a 14 lb. hammer. Radial fractures ran to the centre of the end tiles, resulting in an outlet for the gas into the flue. This trouble was traced to the unreasonable use of the scurfing tool.

By allowing the air to circulate in the retort, and only occasionally gently easing the carbon with the scurfing tool we now avoid all damage of this kind.

The Distribution Side.

The condition of things in the district was parallel to those on the works. The complaints book contained 156 complaints that were awaiting attention. For weeks after I took charge there was a continual stream of callers at my house, with the same enquiry in every case. When did I intend to deal with their complaints?

The staff employed by the Company consisted of three stokers, an elderly labourer, a part-time secretary, and myself.

We had about a thousand meters in use on the district. One hundred of them were comparatively new dry ones, while the rest were all 2-light wets dated 1882, and had been designed for use with a gas pressure of 2 in. It was not surprising, therefore, that consumers using gas boilers complained of a poor supply of gas.

Owing to the very long period that the wet meters had been in use, deposits of dirt and rust had accumulated in the float chambers and beneath the measuring drums. This caused a considerable amount of inconvenience to the consumers, as the floats would sometimes stick in the closed position, or the drum would become unable to revolve, and the meter had to be washed out before a supply of gas could be obtained.

Every day someone would have trouble of this kind with

the meter, and I decided to replace them with No. 2 standard dry meters. I believe I am correct in saying that small high capacity meters were not at that time on the market.

During the eight years I spent at Shelley all the wet meters were exchanged for new dry ones. We could not afford to replace all the meters in one year, but did the work gradually out of revenue.

Just as is the case in most other places there was a gradual drift from ordinary meters to the prepayment type. I decided that all the new prepayment meters should be for shillings only, and this proved to be a time-saving factor during the quarterly collections.

Though this was a scattered area, two men working together seven hours per day regularly collected the money from 90 meters each day, and on one particular section the number was always 100. The collectors would add the receipt book up as they went along and make up the silver into five pound bags at the same time, so that the money was easily balanced when they returned to the office.

At the end of each year there was always a surplus of about £8 in cash over the amount actually due from the consumption registered by the meters.

Unaccounted-for Gas.

The output of gas at this time was 19,200,000 cu.ft. and the sale was 11,700,000 cu.ft. There was obviously something very much wrong, and though rather more gas went out during the night than would have been expected, we were for several months unable to discover anything but the normal run of small leakages on our 8½ miles of main.

In January, 1928, when I had been at the works eight months, I had complaints of poor pressure at a group of houses situated at the top of the hill, 1½ miles away from the gas-works These houses were on a 2-in. cast-iron loop main that branched out of the 4-in. main on the Penistone Road to join it again a quarter of a mile further on. The lights in the houses would go gently up and down, as though the tap was being slowly turned each way.

Across the road from these houses was a huge heap of faulty stone, behind which was situated a stone quarry. Gas was used at the quarry for starting the gas engine, after which suction gas was brought into use. We had no complaints of poor supply from the quarry, and I satisfied myself that the poor supply on the section was not due to gas being used at the quarry during the evening.

Pressures taken at several of the houses during the evening showed 1 in. only. During the day there was 2 in., but as the area in question was situated at least 200 ft. higher than the gas-works, the pressure should have been 5 in.

The ground was tested at several points for leakage, but none was found. Then I turned my attention to the main supplying the quarry.

The road was opened at several points before the quarry supply was discovered. The pipe took a direction leading straight towards the stone dump, and as it was impossible to trace it under this, I decided to try the effect of closing a valve that we had discovered on the pipe.

The gas supply to the neighbouring houses became normal immediately the valve was closed, and we had no further complaints of low main pressures from that section.

Enquiries later produced the information that the supply pipe to the quarry was formerly exposed at a point where it crossed a stream, and when the quarry owners decided to tip their waste stone over that position, supports were placed under the gas pipe, covers were placed over the stream, and the tip was formed.

The tremendous weight above the cast-iron pipe had caused a fracture, and the escaping gas was conducted up the track of the stream in such a way that the concentration of gas above the ground was nowhere sufficient to cause uninterested persons to think it worth while reporting the leakage to the Gas Company.

The reduction in the gas output was immediately apparent to the works. The leakage dropped by 5 million cu.ft. per annum, and the reduction in coal consumption was about 400 tons.

This meant that we could close one setting down entirely, working afterwards with one bed in the summer and two in the winter.

The considerable saving in coal thus effected was not, of course, all profit, as we were at this time receiving 7s. per ton more for our coke than we were paying per ton for coal. There was a saving on the balance of about £150, and an incidental all-round saving due to a general reduction in other expenses at the works. The setting renewal costs were reduced by the price of one setting in three years, and the reduction in the amount of work the stokers had to do left them time to do all the labouring work and the painting, whereas it had formerly been necessary to introduce a certain amount of casual labour for these things.

At the end of 1928 the balance-sheet showed a net profit of £748. This was a record that had never been approached before from the time the Company was formed in 1859.

As the Company was not allowed to pay more than 10% less tax in dividend for any one year, the record profit was not exactly a good thing. The gross profit must have been in the region of £1,000, and we could very well have spent an additional amount of £500 on meters and the considerable amount of repairs still needed by the plant, and thus halve the sum that in this case had to be paid to the tax authorities.

Later we suffered at the hand of the Rating Assessor. Basing his arguments on the increased profits of the Undertaking, he substantially increased the Company's rating assessment.

Public Lighting.

The area was lighted by 100 2-lt. Falcon suspension lamps, most of which were bought before the war, the others in 1921. They were owned and maintained by the local Councils. The Gas Company determined the gas consumption from the average amounts that were registered at metered lamps that were situated at suitable points.

The lamps were taken down each spring and re-erected each autumn by a local plumber. The Council's roadmen did the work of lamplighters, and the results were about the worst street lighting that I have ever seen. The times of lighting varied according to the whims of the lamplighters. Each man was in charge of the number of lamps that he could turn on in three-quarters of an hour; consequently, if it was a bad night, or if the man wanted to get to bed early, the first lamp would be turned out at 9.45 p.m. and the last one at 10.30.

At the time of the full moon, street lighting was suspended unless it happened to be cloudy weather, so that often we found the lights were not lit when they should have been.

I placed proposals before the two local Councils for our Company to take over the maintenance and full responsibility for the street lighting, and to fit automatic controllers. The lamps to be lighted from dusk to 11 p.m. and to give morning lighting from 6 a.m. till dawn during the winter.

After individual arguments that controllers were a failure because a neighbouring township had tried them 20 years before without success, our offer was accepted.

We took all the lamps into an old warehouse of ours and thoroughly cleaned and overhauled them, and fitted Horstmann Newbridge controllers, with new pilot tubes and tips. Each lamp was then tried on a gas supply before it was considered ready for use.

I persuaded my Company to present each Council with one 6-lt. "Rochester" suspension lamp. These we fitted on extension pieces on the existing standards, giving the lamps a height of 18 ft. above the ground.

Later each Council purchased several of these lamps for their main points.

Our charge of £3 5s. per lamp for the full lighting season was a saving to the Councils. The lighting was good, morning lighting was much appreciated by the early morning workers, and the Gas Company made an additional net profit of rather more than £100 per annum.

Service.

Before 1927 the Gas Company had taken no interest in the gas supply after the gas had passed the consumers' meters. There had been no advertising, and the sales of apparatus were *nil*.

I was keen to re-establish the value of gas in the opinion of the consumers, and made a point of giving free service. No complaint, however trivial, was ignored, and with the help of a local man of my own age whom I had trained to do

gas fitting work, we succeeded after some years of very hard work in reaching the point when we could give prompt attention to any matter requiring our services on the district.

Cookery demonstrations were arranged in the local schools which were crowded each day, and it was no unusual happening for the room to be so packed that I was unable to get past the door.

The first series of cookery demonstrations was held in 1929, when during five days we sold nine cookers. The following week we received orders for four more, and from that time forward we had a steady sale of apparatus which, together with payment for work done, amounted to a regular £350 per annum.

This was an improvement on the former conditions, but I was of the opinion that much more apparatus could be sold if we opened a showroom and placed our wares constantly before the public.

This matter was several times discussed by our Board, but we were unable in the circumstances to do more than keep a small stock of cookers, &c., in a room where they could be seen by consumers on request.

I have now been away from the works for four years, and about fifteen months ago it became possible for a showroom to be opened. Since that time the apparatus sales have increased to about three times the amount that was previously sold in the same length of time.

Discussion.

The **President** (Mr. A. Wylie, Sheffield) said that through organizing ability and the adoption of a progressive policy Mr. Lister had achieved success in very unusual circumstances.

Mr. Whiteley (Director, Engineer, and Secretary of the Kirkburton Gas Company, with which the undertaking dealt with in the Paper had since become amalgamated) said he wished to compliment Mr. Lister on the manner in which he had described the exceptional difficulties of the time under review.

Mr. W. S. Hubbard (Leeds) also congratulated Mr. Lister on the way he had overcome abnormal difficulties.

Mr. S. H. Stokes (Elland) said Mr. Lister's Paper had been highly interesting, and the manner in which he had tackled the problems facing him was an object lesson to many a man on a large works as well as on a small works.

Mr. J. Richmond (York) said that quite recently it has fallen to his own lot to find similarly unexpected things on some old plant of small works, and he gave several instances, some of which, he admitted, were almost enough to frighten one at first sight.

Mr. T. G. Lewis (Leeds) said he had been interested in Mr. Lister's references to the price of gas. He understood him to say the undertaking lost 2,000,000 cu.ft. of business when the price went up from 5s. to 5s. 10d. per 1,000 as a result of the 1926 Coal Strike. Did they get that business back when that special reason for price increase came to an end?

Mr. Lister said he could not give a definite answer to the question because he had been away from that undertaking four years. There was, however—as he said in the Paper—considerable resentment when the price went up owing to effects of the Coal Strike. They were a textile industrial population and a very careful population in matters of household finance, and when the price went up they reasoned the position out in their own way and met the situation by economizing in gas usage. It was a case of less consumption—not loss of consumers. So far as he recalled, however, they never quite came back to the former consumption, because in the meanwhile electricity had come along and about a quarter of the consumers took up electricity for lighting. The loss in lighting was in due course made up by increase in sale and use of other gas appliances.

Mr. C. J. Dougherty (Leeds) proposed a vote of thanks to Mr. Lister, and **Mr. Stokes** seconded.

OPERATION OF Intermittent Vertical Chambers Combined with Dry Coke Cooling

From a Paper to the Manchester and District Junior Gas Association, March 4.

By EDMUND BATES, M.Inst.Gas E.

The plant under review was installed by Gas Chambers and Coke Ovens, Ltd., and consists of three independent settings of three chamber ovens each with semi-recuperators, forming a bench of nine ovens in all, and has a nominal capacity of 800,000 cu.ft. of 500 B.Th. U. gas per diem when working on a twelve-hour charging schedule and carbonizing 50 tons of coal. Each oven has a maximum capacity of 3 tons of coal when using washed slacks.

The three cooling chambers are situated directly beneath the settings, and deal with hot coke discharged therefrom. The inert coke cooling gases circulate through a Spencer-Bonecourt waste-heat boiler, and the hot waste gases from the settings pass through a Cochran-Kirke waste-heat boiler fitted with Sinuflo tubes, prior to entering the stack. This boiler can be by-passed when required, the vacuum on the main flue then being controlled by the main damper, which is situated near the chimney.

The main flue is constructed of 4-½in. firebrick and 4-½in. insulation brick, the whole being encased with ¼in. M.S. plate to ensure that it is airtight.

Bunkers and Coal Handling Plant.

Directly over the bench is the steel-framed, brick-panelled bunker tower, which is divided into three compartments large enough to contain a three days' supply of coal, coke, and breeze on maximum load. These materials are elevated by a fully automatic, mechanically operated skip hoist fed from a coal blending plant and capable of elevating 15 tons of coal or 10 tons of breeze or coke per hour, thus enabling maximum requirements to be elevated in normal working hours. The coal, coke, and breeze are fed into their respective sections of the main bunker by means of a hand-operated revolving chute housed in the bunker tower at the head of the skip hoist and are discharged through gates situated directly over the chamber charging platform. The coal bunker is partitioned so that tests can be run on spot batches of coal.

A hand-operated charging bus suspended from an overhead track traverses the length of the bench and receives coal and breeze into separate compartments, the coal section consisting of two conical shaped hoppers fitted with adjustable measuring cylinders to vary the weight of coal charged, and also with sliding sleeves which register with the chamber charging holes, thus avoiding spillage and excessive smoke emission during charging. The breeze section of the bus has also two hoppers, each fitted with a visor to control the flow and amount of breeze charged.

Four 2 ft. 6 in. square ventilating shafts provided at each corner of the bunker tower and terminating in four Robertson ventilators on the tower roof have proved very effective in maintaining comfortable working conditions on the bench top.

Chamber Ovens.

The internal dimensions are 9 ft. 9¼ in. on the major axis and 8 in. at the top, tapering to 12 in. at the bottom on the minor axis, the height being 18 ft. The two bottom and the two top courses are built of tongued and grooved

fireclay blocks, the remainder being constructed in Consett tongued and grooved 95% silica refractories. All external walls are insulated and faced with firebrick and redbrick for protection and neat appearance. Charging is carried out through two cast-iron frames fitted with cast-iron plug lids, in the top of the oven. One hinged discharge door is used to empty the oven and carries the weight of the charge during the distillation period. The discharge doors are constructed of cast steel with hollow cast-iron domes bolted to the inside to enable gas evolved in the lower part of the oven to pass freely to the bottom off-take pipe, and also to protect the door from excessive heat. These doors are self-sealing and are operated by a hydraulic ram attached to a drag bar running the full length of the bench. The drag bar is connected to each door by a chain which normally hangs loose but can be tightened by means of an eccentric operated by a lever moving through 180°. The chain thus tightened allows the hydraulic ram to act through the drag bar and so open or close any particular door, power being obtained from town water at a pressure of 80 lb. per sq.in. Should the water supply fail, the operation can be carried out by hand, the change-over being effected in five minutes. After closing, final adjustment is made by seven eccentric levers acting on crossbars attached to the door which are forced against stirrups, thus holding the door tightly against the frame and making a gas-tight metal-to-metal seal.

Method of Heating the Settings.

The settings are heated by the combustion of producer gas and preheated air introduced through adjacent ports in the three bottom flues of the combustion chambers situated between each carbonizing chamber. Correct proportioning in the settings is effected by the adjustment of two nostril dampers over each port.

The hot products of combustion are baffled and controlled by dampers on their passage up the heating flues to obtain an even temperature gradient throughout the oven. On reaching the top of the flues the hot gases pass over to the recuperators, built of tongued and grooved firebrick tiles, where heat interchange is effected between the outgoing gases and the incoming secondary air. After leaving the recuperators, the waste gases pass a cast-iron damper prior to entering the main flue, where they can be either drawn through the waste-heat boiler by a motor-driven fan or by-passed to the stack.

Producers.

There are two external, coke-fired, curtain wall producers adapted for breeze firing should this be desired, and fitted with steam blast, so that if necessary one producer can handle the total requirements of the whole bench on full load while the other is undergoing repairs.

The producers are of the step grate type, and each has a grate area of 42 sq.ft. A constant flow of water is maintained over the step plates to prevent excessive clinker formation, while the primary air to each is admitted through two slides fitted to the clinkering doors. Each producer is fed with coke by means of a 24 in. diameter mild steel tube that runs up to the oven charging platform and acts as a storage hopper. The tops of these tubes are fitted with a cast-iron frame and plug lid, and coke is charged three times per shift of 8 hours from the bunker immediately above. The producer gas passes up two flues behind the curtain wall, and is controlled by two dampers prior to entering a common flue from which rise three uptakes, one for each setting. These uptakes are also damper controlled.

With this arrangement, producers and settings can be worked in any combination according to requirements.

Originally, the producers were clinkered every eight hours, but owing to their ample size this was found unnecessary, and so a twelve-hour clinkering schedule was introduced, which has proved quite satisfactory both on summer and winter loading. By cutting down the clinkering periods the following advantages are claimed:

(1) Fuel saved due to producer doors being shut for longer periods.
(2) Less pan ash to be handled by operator and telpher.
(3) Less time spent by yard man picking unburnt coke from pan ash.
(4) Time, current, and wear and tear reduced on skip hoist due to reduction of coke elevated.
(5) Higher quality producer gas.
(6) Less dust carried forward into settings.
(7) More time available for plant operator to attend to other duties.

Cooling Chambers.

The three Collin cooling chambers are situated immediately below each of the three settings, one cooling chamber serving three ovens. A travelling combined lid lifter and hot coke chute guides the discharged coke into the cooling chamber immediately below. The cooling chambers are built of fireclay refractories insulated on the outside walls and fitted with louvre type cast-iron floor plates set at an angle of 33° which ensures the cooled coke sliding freely on discharge. The rectangular charging door is built up of mild steel plate and angles protected on the underside by a reinforced fireclay lining. This door lowers on to a cast-iron frame containing a sand seal. On the top of the door are two lifting lugs which engage with the lid lifter when required. There is one heavy cast-iron discharge door and frame, with machined faces, to each cooling chamber. These doors are hinged on the top and fitted with an eye near the bottom edge to which is attached a shackle and wire rope, operated by a hand chain and gearing for raising and lowering. Four swivel, square threaded bolts attached to the door frame and tightening on to four lugs on the door serve to make a gas-tight joint.

Inert gases formed after the first pass by the initial oxygen are composed principally of carbon dioxide and nitrogen. On leaving the cooling chamber these gases pass through a sand-sealed valve and enter a common flue leading to the superheater and Spencer-Bonecourt boiler, where a motor-driven fan fitted to the outlet flue re-circulates the gases along a 20 in. diameter welded mild steel main from which separate feeds, controlled by butterfly valves, re-introduce the gas to the underside of the louvre grate in the cooling chamber. The inert gases again pass through the hot coke and transfer further heat to the boiler. As the cooling chambers are charged with hot coke at regular intervals a steady supply of steam is maintained. The volume of inert gases being circulated is regulated by the speed of the fan motor, further adjustment, if necessary, being effected by closing a damper on the fan outlet.

As the existing telpher is only capable of lifting approximately 1 ton at one filling, the coke charge, weighing about 2 tons, has to be divided. This is effected by discharging the coke on to a mild steel platform, where it is controlled by counterbalanced finger gates which allow any desired amount to be run into the telpher skip, which is wheeled into position on a bogie, the centre line of the telpher track being some 5 ft. away from the face of the cooling chambers.

The advantages of the Collin method of dry cooling coke from settings that discharge hot coke are numerous, the most important being:

(1) A perfectly dry coke, of excellent appearance, is obtained, which is easily ignitable and has a high calorific value with less friability than water-quenched coke.
(2) Less breeze and smalls are produced.
(3) Cleaner coke produced due to breeze not sticking to water film as on wet-quenched coke, which gives better grading.
(4) Steam raised from sensible heat can be utilized for process and power purposes.
(5) Coke, being cool, is easily handled.
(6) Corrosion of steelwork entirely avoided with consequent reduction of painting and maintenance costs.
(7) Works kept cleaner and outside nuisance from steam, smoke, and dust avoided.
(8) No "fliers" from coke on burning due to absence of internal stresses set up in structure by sudden chilling as when water-quenched.

From experience it has been found advantageous to operate the coke cooling plant with a minimum velocity of

inert gases at as high a temperature as possible at the boiler inlet. This has the following advantages:

(1) Lower power consumption of circulating fan motor.
(2) Less vacuum on chambers with consequent reduction of air leakage into system.
(3) Higher boiler inlet temperatures which ensure more efficient steam raising.

If the flow of cooling gases is reduced below a critical point, however, the temperature of the inert gases rises unduly, and the coke is discharged hot, with a consequent risk of firing when stacked in the yard. On the other hand, if excessive vacuum is set up due to the fan speed being too high air is drawn into the system through discharge door joints and brickwork, with the result that the coke is burned and on discharge is coated with a fine layer of ash which spoils the appearance. A temperature of from 400° to 420° C. at the boiler inlet gives the most satisfactory results, the maximum weight of steam being generated with a minimum power consumption. The temperature of the gases leaving the boiler is approximately 220° C. Under these conditions a slight pressure is maintained at the top of the cooling chambers, thus preventing excessive air leaks, while the coke is discharged sufficiently cooled to prevent firing when stacked, and entirely free from the coating of ash mentioned. Air leaks are further reduced by patching the brickwork where necessary with a putty of boiled oil and fireclay, using a fireclay wash as a finisher.

The figures in Table 1 give some idea of the conditions obtaining in the cooling plant, together with the boiler evaporation, when operating under different loads:

Whitworth V thread, but after twelve months' working the majority had stripped, and so the whole set was replaced with bolts having a more substantial square thread, which has proved very satisfactory. If for any reason the cooling plant boiler is not working, the red hot coke is loaded into the skip in the usual way, and quenched by sprays fitted along the front of the cooling chambers. Under normal working conditions these sprays are used to damp the coke on discharge in order to keep down dust. On light loads the steam generated per ton of coke cooled is low, but it is considered well worth while to cool the coke rather than quench it in order to gain the many other advantages, for the coke produced by intermittent vertical ovens in conjunction with the dry cooling plant is of exceptional quality, and in this case finds a ready local market.

The coals carbonized during the year ended March 31, 1937, consisted of approximately 50% South Yorkshire slacks and 50% South Yorkshire wash peas, the average proximate analysis of these coals being:

	%
Volatile matter	34·48
Ash	3·54
Fixed carbon	57·61
Free moisture	1·89
Hygroscopic moisture	2·48
Sulphur (separately determined)	1·35

Gross calorific value, B.Th.U. per lb., 14,011

By suitable blending, a high quality, dry cooled coke having a density of 30·7 lb. per cu.ft. and an ash content of under 8% is produced, which satisfies both industrial and domestic consumers, providing the correct grade is supplied.

TABLE 1.

No. of Ovens Discharged per Day.	Tons of Coke Cooled per Hour.	Steam Raised per Ton of Coke Cooled. Pressure 100 Lb. per Sq.In. Superheat 100° F.	Feed Water Temp. ° C.	Gas Temp. at Boiler Inlet ° C.	Gas Temp. at Boiler Outlet °C.	Gas Pressure at Boiler. Water Gauge. In.	Gas Pressure at Boiler. Water Gauge. Out.	Power Consumption of Fan.
8	0·70	490	82	390	200	− 0·18 in.	− 1·00 in.	3 H.P.
9	0·79	550	82	400	220	− 0·20 ,,	− 1·25 ,,	4 ,,
10	0·88	585	83	410	210	− 0·20 ,,	− 1·25 ,,	4 ,,
11	0·97	600	81	420	220	− 0·20 ,,	− 1·5 ,,	5 ,,
12	1·05	653	83	420	215	− 0·20 ,,	− 1·5 ,,	5 ,,
13	1·14	702	82	420	220	− 0·23 ,,	− 1·75 ,,	6 ,,
14	1·23	721	82	420	220	− 0·23 ,,	− 1·75 ,,	6 ,,
15	1·31	730	80	420	225	− 0·23 ,,	− 1·75 ,,	6 ,,

The boiler on the waste gas flue yields on an average 1·9 lb. of steam at 100 lb. per sq.in. and 100° F. superheat per pound of coke consumed in the producers, which is 18% of the weight of coal carbonized.

The analysis of the inert circulating gases on the coke cooling boiler as determined by the Orsat apparatus are as follows:

	CO_2.	O_2.	CO.
Immediately before charging	16·6	1·2	—
Immediately after charging	15·2	1·0	—
Period midway between	17·2	1·0	—

There is about 1% excess air pulled in through the brickwork and door joints, but this is useful in preventing the accumulation of carbon monoxide and explosive mixtures in the system. If the oxygen content is found to be in excess of 1% the cause is found and immediately remedied. Excess oxygen is usually due to leaking brickwork or deposits on the inert gas valves which prevent them from being shut when the chamber is sealed off during the discharge period.

By screening several batches of coke direct from the cooling chambers it was found that on an average 4 cwt. of breeze was discharged per chamber, which, allowing 3 cwt. for re-circulation, gives a net gain of 1 cwt. This is used on the boilers, but if necessary it can be mixed with the coal and returned to the ovens, and thus converted into large saleable coke.

The coke cooling plant has proved to be trouble free, the only expense incurred over a period of three years' working being for the renewal of the swivel bolts used for tightening up the discharge doors. Originally these bolts had a standard

The carbonizing results for the above year were as follows:

Coal carbonized	10,353	tons
Gas made (corrected to 55° F., no allowance being made for variation of pressure)	173,186,600	cu.ft.
Average calorific value	500	B.Th.U. per cu.ft.
Gas made per ton of coal carbonized	16,728	cu.ft.
,, ,, ,, ,,	83·64	therms
Coke for sale per ton of coal carbonized	9·5	cwt.
Tar produced	11·5	galls. per ton
Benzole produced	1·2	,, ,,
Average cost of gas into holder	2·55d.	per therm

During the first year's working, the coal charged per oven was calculated weekly from the number of ovens charged and coal elevated, an allowance being made for any variation of coal in stock. This method, however, gave a wide variation in the weight charged per oven, possibly due to the moisture content of the coal, which fluctuates from 1·5% in summer to as much as 10%, on occasions, in winter, but more likely due to the difficulty of accurately estimating stocks on a weekly basis. Because of this fluctuation it was decided to standardize the charge, this being effected by dividing the coal carbonized during the previous six months by the number of ovens charged. This has considerably facilitated the comparison of various results obtained when operating under different conditions. For the year ended March 31, 1937, the coal charged per oven was taken as 2·76 tons, a figure which checks up accurately with the weights of several spot charges from the coal bus. These are obtained by emptying charges on to the charging floor, bagging, and weighing the coal, allowing for a slight error due to loss of moisture.

The weight of the breeze pad dropped into the oven is approximately 3 cwt. This amount was determined as the result of careful experiment. If less than this quantity is used there is a tendency for the bottom doors to become slightly pitched, while the bottom of the coal charge is not thoroughly carbonized, due to being below the hot zone of

the oven. If more than 3 cwt. of breeze is charged, the coal charge is lifted so that the cracking space at the top of the oven is reduced, and it may be found difficult to get all the coal into the oven. Furthermore, handling and elevating costs are increased to no useful purpose.

The free cracking space allowed above the coal on charging is approximately 2 ft., which increases to about 4 ft. due to shrinkage on carbonization when using the classes of coal detailed above.

The weight of coal charged per oven has recently been increased to 2·84 tons, and as a result the yield has since averaged slightly over 86 therms per ton, *plus* 1·2 gallons of benzole. Two reasons for this improvement are that with heavier charges a greater depth of coke is produced, and this increases the efficiency of the water gas reaction, while for the same volume of gas the number of ovens charged is reduced, thus eliminating the inevitable losses that are incurred when an oven is sealed off. These advantages seem to offset the benefits obtained by the cracking effect of the free space at the top of the oven that existed formerly.

Carbonizing Data.

The data in Table 2 are the outcome of two years' experience on the plant, and if these figures are worked to, average results approximating those obtained over a year's working can be expected, providing the class of coal and moisture content do not vary considerably.

As the number of ovens charged per day decreases it will be observed that the period between charges becomes greater for each oven reduced. During this period the calorific value of the make varies considerably; nevertheless the gas been found possible considerably to reduce the fuel consumption.

The maintenance of a supply of hot liquor is absolutely essential for the working of the carbonizing plant. Spraying the crude gas in the ascension pipes and foul main with hot liquor prevents pitch formation by washing out the light tar oils which then act as a solvent to the heavier tars, and also by keeping the temperature of the foul main below the distillation temperature of the tar. It is important, however, that the liquor temperature is maintained at a minimum of 60° C. or sudden chilling of the foul gas will also precipitate pitch. Each of the 21 sprays is cleaned daily to ensure that no blockage takes place, and, if necessary, live steam is introduced into the liquor storage tank to maintain the correct temperature. The foul main temperature recorder is a useful check on the condition of the sprays, a temperature of 80° C. being normal. Any rise above this figure indicates that either the sprays are not functioning correctly or that there is excessive pull on the ovens causing the intrusion of flue gases into the ovens, with a consequent rise in temperature of the gas entering the foul main.

The volume of gas made can be varied to meet widely fluctuating demands, outputs varying from 370,000 to 750,000 cu.ft. per day having been obtained with yields of over 85 therms in each case.

A period of 24 hours is required to enable the settings to settle down to a new charging schedule, but during this period the amount of gas made is constantly moving in the direction ultimately required, and so the plant can be operated with no loss of efficiency over its whole range. Another feature of importance when dealing with flexibility

TABLE 2.

No. of Ovens Charged per Day.	Time between Charges.	Carbonizing Period.	Steaming Period.	Carbonizing Steaming Period.	No. of Ovens Steaming.	Flue Temperatures ° C.				Temp. Waste Gases Leaving Recuperator, ° C.	Foul Main Conditions, In., W.G.
						1st Row.	2nd Row.	3rd Row.	Top Row.		
	Hr. Min.	Hr.	Hr.	Hr.							
8	3 0	14·50	12·00	26·50	4	1,195	1,190	1,185	880	470	+ 0·03
9	2 40	12·84	10·66	23·50	4	1,230	1,225	1,210	900	485	+ 0·02
10	2 24	11·50	9·60	21·10	4	1,245	1,240	1,215	915	500	+ 0·01
11	2 11	12·59	6·55	19·14	3	1,255	1,250	1,230	930	510	0·00
12	2 0	11·50	6·00	17·50	3	1,270	1,265	1,245	945	520	− 0·01
13	1 51	10·60	5·55	16·15	3	1,285	1,280	1,260	960	540	− 0·02
14	1 43	9·78	5·14	14·92	2	1,300	1,295	1,275	975	560	− 0·03
15	1 36	10·70	3·20	13·90	2	1,310	1,305	1,290	990	580	− 0·04
16	1 30	10·00	3·00	13·00	2	—	—	—	—	—	—
17	1 25	9·37	2·82	12·19	2	—	—	—	—	—	—
18	1 20	8·82	2·67	11·49	2	—	—	—	—	—	—

The plant has not yet worked above 15 ovens charged per day.

as made is fed direct into the holder feeding the town, no special mixing being required to produce a comparatively straight line on the town, thus showing that from this standpoint intermittent verticals are a practical proposition even on a small works where holder capacity is low and where facilities for mixing do not exist.

Owing to the regulated continuous scurfing system which is in operation, the scurf formation is controlled to keep the joints in the oven walls tight. It has therefore not been found necessary to do any patching on the oven walls, and after three years' working the walls are as straight as when first put into commission, spalling being non-existent. The reason for the good condition of the ovens is in no small measure due to the fact that they were brought up to working temperature very gradually over a period of fourteen weeks, according to the chart supplied by the manufacturers of the silica, and since that time the ovens have not been let down. Leaks in the producer gas flues are detected by analysis, and also by taking out a sight box plug at the end of the flue and covering the sight hole with a piece of plain glass previously warmed to prevent cracking. Flames can be seen where air is entering, while hot spots occurring near the flues from the producers indicate leakage in this direction. Pointing the brickwork with a mixture of boiled linseed oil and fireclay is carried out until all leaks are eliminated, the brickwork then being brushed over with a fireclay wash. Straight joints at cleaning holes in producer gas flues have been found to be common sources of leakage due to expansion and contraction taking place when operating at different temperatures. By keeping these joints tight it has is that gas of reasonably constant composition is produced. In this case the analysis of the gas (taken on the Orsat apparatus) on all loads up to 84%, above which the plant has not yet worked, is approximately 0·3% oxygen, 3·8% carbon dioxide, and 15% carbon monoxide, the ratio of water gas to coal gas being fairly constant under all conditions, while air admitted at the exhauster inlet is controlled by fitting a suitable orifice to give the above oxygen figure in the purified gas.

The intermittent vertical chamber ovens and dry coke cooling plant described have proved very satisfactory over a period of three years' working life, and when I last had the opportunity of seeing them they were in good condition. As they are capable of carbonizing almost any class of coal, purchases were made from the most favourable markets, and this coupled with low operating and maintenance charges has enabled gas to be produced at a very reasonable figure. Reliability is absolutely essential in the case of carbonizing plant, and the risk of breakdown is reduced to a minimum by the absence of continuously operating machinery. The flexibility of the plant is all that can be desired.

The dry cooled coke is proving very popular both with domestic and industrial consumers, while on the works the steam raised during the cooling process is helping to reduce the fuel on the Lancashire boilers.

Benzole production has been carried on successfully in conjunction with the ovens, and although only 1·2 gallons have been obtained per ton, this figure will soon be raised to 2 gallons per ton by increasing the capacity of the washer.

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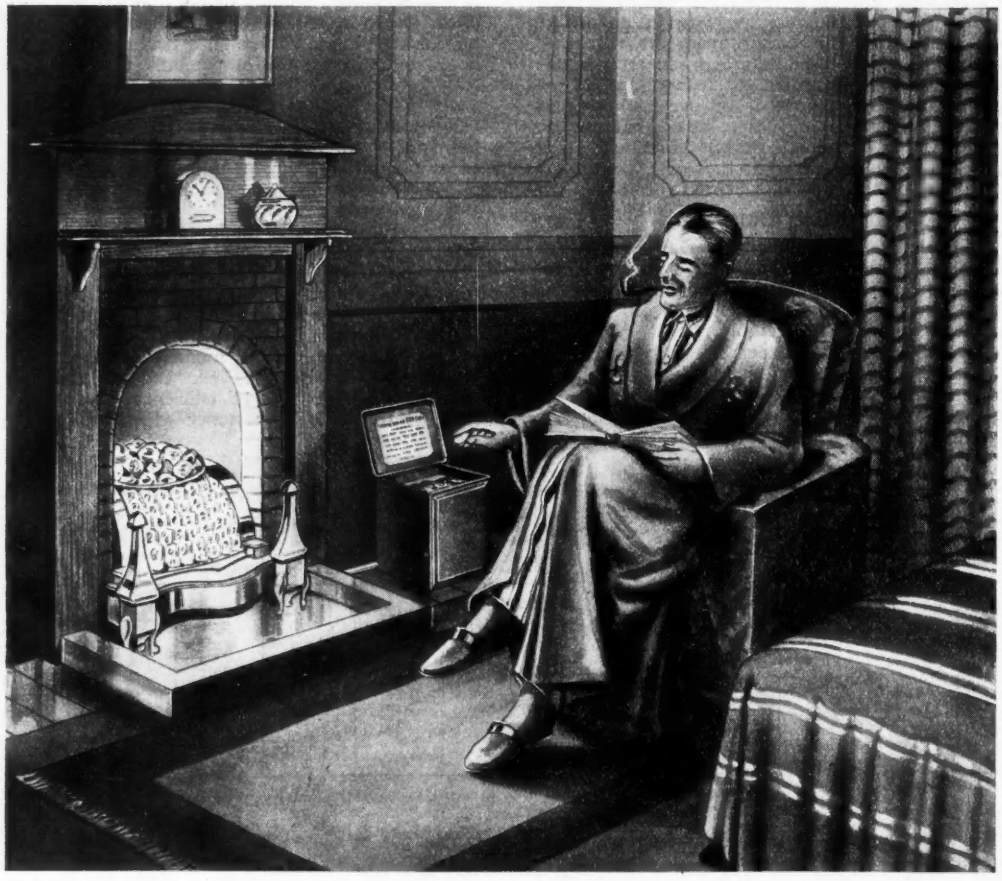

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Newcastle Coal Prices Enquiry

The Central Appeal Tribunal set up under the Coal Mines Act, 1930, as amended by the Coal Act, 1938, opened at Caxton Hall, London, S.W. 1, on Saturday, March 4, its first enquiry since it was appointed. Its purpose was to hear the appeal by the Newcastle-on-Tyne and Gateshead Gas Company against a recent decision by the Durham District Committee of Investigation concerning the 1939 contract prices for Durham unscreened coal.

The members of the Tribunal are Mr. J. Norman Daynes, K.C. (Chairman), Mr. E. Furnival Jones, and Dr. A. W. Pickard-Cambridge.

It was alleged by the Company that the Durham Coal Sales Control Committee, in fixing the prices, had shown unjustified discrimination, and that similar classes of gas coal as used by the Company had been offered to large London gas coal consumers at a lower price, on the basis of equivalent pithead prices, than that at which the Company could obtain it; and the contention was that they were subsidizing competitive prices offered on the London market.

The respondents were the Executive Board of the Durham (Coal Mines) Scheme, 1930, who denied that there had been discrimination, and held that coastal and railborne trades were different trades and that prices were fixed in accordance with their duty under the Act.

(The recent enquiry by the Durham District Investigation Committee was reported in "JOURNAL" of Nov. 30, 1938, p. 722, Dec. 21, 1938, p. 900, and Jan. 11, 1939, p. 121; while the decision of the Investigation Committee, to the effect that the prices were fair and equitable, was published in the "JOURNAL" of Jan. 18, p. 179.)

The Company was represented before the Tribunal in London by Mr. J. H. Thorpe, K.C., and Mr. C. B. Fenwick; and the Executive Board was represented by Mr. F. R. Evershed, K.C., and Mr. V. M. C. Pennington.

Representations for a hearing were made also by Mr. J. E. Swan (Secretary of the Durham County Mining Federation Board and General Secretary of the Durham Miners' Association), who urged that the Executive Board or the Sales Control Committee had not discharged their liability to improve the Durham miners' wages to what the miners' representatives considered to be a fair and reasonable standard. It being pointed out to him that he must satisfy the Tribunal that his representations had a direct bearing on the appeal, he contended that they were very germain to the appeal in so far as the miners' representatives were not content with the general prices prevailing, and any relaxation of those prices would have an inimical effect on wages. After discussion, in the course of which Mr. Thorpe suggested that it would not be in the power of the Tribunal to increase prices if Mr. Swan contended they were too low, the Tribunal intimated that Mr. Swan would be heard at a convenient time.

Among those present at the enquiry were Viscount Ridley, Sir Alexander Leith, and Sir Cecil Cochrane (Directors of the Newcastle Company), and Colonel S. S. Ogilvie (Joint Manager of the National Gas Council).

The Case for the Company.

Mr. THORPE, opening the case for the Company, said the issue which the Tribunal was asked to determine was whether the prices fixed to be charged to the Company for unscreened gas coals for the year 1939 by the Durham Coal Sales Control Committee were having, or were likely to have, an effect contrary to public interest, or whether such prices ought to be amended on the ground that they were unfair and inequitable.

He drew attention to the decision of the Committee of Investigation, and to the fact that, by a majority, the Committee were not prepared to make any representation to the Executive Board as to the prices complained of. Thus, the Tribunal had before it the decision of the majority; there was in fact a minority decision, and he urged that the Tribunal should also have the decision of the minority. In seeking to obtain it, a letter had been forwarded to the Secretary of the Committee of Investigation expressing a desire that it should be before the Tribunal; and it was stated in reply that, should the Tribunal wish to have information as to the views of individual members of the Committee, no doubt they would take the necessary steps.

The CHAIRMAN commented that the Tribunal was interested in the arguments; whether a view was that of one member of the Committee or another was of no importance.

Mr. THORPE, continuing, said that the total increase in prices in 1939 would involve the Newcastle and Gateshead Gas Company in an extra cost of £35,500 for the year 1939. But the matter did not rest there, because no fewer than eight other gas undertakers in the Durham district were dependent on the Tribunal's decision. So that, while appearing for one Company, he represented the interests of a very large proportion, if not the whole, of the statutory gas undertakers in the Durham district.

He believed it would be necessary for members of the Tribunal to eliminate from their minds all pre-conceived ideas of how a business should be run. Relations between the coalfields and their customers were as far divorced from ordinary business considerations as could be possible. The laws of supply and demand were eliminated. There was a constant demand from gas undertakers and an unlimited supply, and if anything colourably like competition emerged, it seemed to him that it was given the euphemistic name of co-ordination. Business considerations must be eliminated, and one must rely entirely on a statutory code, which had become necessary when Parliament had decided that post-war conditions required some artificial and statutory provisions for the coalfields.

The total quantity of commercially disposable coal in the Durham coalfield was about 28 million tons per annum. Of that, about 8½ million tons (or 30%) was sold to gas undertakers for carbonization. Of that 8½ million tons, 6½ million was shipped coastwise, 1½ million tons was sold for export, and ½ million was delivered by road and rail in the Durham district. Presumably, in order to find out the most satisfactory price, one would consider the price charged for the 6½ million tons that was shipped coastwise, because that represented the bulk of the sales for gas making.

Considerable Development.

The Newcastle and Gateshead Company supplied gas throughout the whole industrial area on both sides of the Tyne, and there was very considerable development in that area. It was not until the prices now complained of were offered to the Company that anybody had tried to deprive it of the advantage of obtaining coal cheaply by reason of its proximity to the coalfield. The next nearest coalfield from which it could obtain its coal was Yorkshire, and that would mean an extra 10s. per ton delivery costs. The London Gas Companies competed with the Newcastle Company in the sale of tar on the Continent, and in that competition they had an advantage of from 2s. to 5s. per ton by reason of their geographical position. The Newcastle Company claimed that it was entitled to keep the advantage of its geographical position when buying coal; if anybody sought to deprive the Company of that advantage and to charge a lower price for similar coal to gas undertakers in areas farther away from the coalfield, that was *prima facie* unfair.

Another consideration was that if the Gas Company obtained cheap coal because it was near a coalfield, it was under an obligation to supply cheap gas, and it must be efficient in order to enable gas to compete with cheap coal. If the Gas Company wished to increase its profits it must reduce the price of gas, whereas if the collieries wished to increase their profits they had to increase the cost of their commodities. The Company had an admirable record in the north of England, being pioneers of cheap gas for industry, and gas was rapidly superseding oil fuel. The figures representing the increase of gas consumption for industrial purposes were astronomical, and the first rolling mill and the first glass mill to use purified gas were in Newcastle; industrialists were changing from the use of producer gas to town gas. As that work progressed, it became all the more important that the Company should not be charged too high a price for coal. It claimed to have been a good customer to the collieries in the past, and good servants to the public. He believed it was the only large gas undertaking which had not increased its price of gas during the mining dispute in 1926; and it was a friend to the miners, because in 1935 it had acquiesced in the payment of an extra 1s. per ton of coal, and in that way had paid £22,000 voluntarily towards miners' wages up to Dec. 31, 1938.

In 1937 the Company had purchased from two coke-oven plants 3,861 million cu.ft., and had manufactured 3,411 million cu.ft.—*i.e.*, it was purchasing 53% of the gas it sold. The proportions for eight months of 1938 were 3,199 million cu.ft. of coke over gas purchased, and 2,287 million cu.ft. manufactured. The revenue which the coke-oven owners derived from the sale of their gas to the Company represented more than 10% on the capital cost of the ovens, and he claimed that the purchases of coke-oven gas

represented a very material consideration in the success of those businesses. If the 3,861 million cu.ft. of gas had been made at the Gas Company's works it would have represented the carbonization of 264,000 tons of coal. During the last twelve months the combined coke-ovens had carbonized 750,000 tons of coal. If it could be demonstrated that those coke-ovens would not have been erected on their existing sites but for the anticipated revenue from the Gas Company, then the fact that they were there meant that an extra half million tons of coal were carbonized in a year; and that was to the benefit of the collieries.

In July, 1938, the Central Council had extended the time for forward purchases and deliveries from June to December, 1939. The Newcastle Company had already purchased in 1935, for delivery in 1939, 20,000 tons of class B coal. The Company had then proceeded to purchase from the Board further quantities, and it was going to take for 1939 25,000 tons from Northumberland. The total quantity required for 1939 was 207,500 tons, including the 20,000 tons purchased in 1935, and 5,000 yet to be purchased on the coalfields, and which would be obtained at a price which the Tribunal considered to be proper. The quantity which was the subject of complaint was 147,500 tons.

Discussing in more detail the manner in which the matter had arisen, he said that immediately the Central Council had extended the time for forward purchases and deliveries, a representative of one of the big London companies had come to Durham and had entered into a contract to buy class B coal for delivery at 19s. 3d. per ton f.o.b., which represented an average pithead price of 17s. 6d. That represented an increase of 4s. per ton on the price ruling for class B coals in the summer of 1935; at that time the f.o.b. price was 15s. 3d. and the pithead was 13s. 6d. Having heard that the contract was made with the London Company, Mr. T. P. Ridley (Secretary and General Manager of the Newcastle Company) had called upon the Chairman of the Sales Control Committee and had said that, but for that contract, he would have asked for a price less than 4s. above the 1935 summer price; but inasmuch as the contract with the London companies had been made, the Company was prepared to buy class B coals for 1939 delivery at the same price—*i.e.*, a pithead price of 17s. 6d. The class B coal constituted the bulk of the Company's coal purchases. But the Chairman of the Sales Control Committee said that the Company must pay a price 5s. above the 1935 summer price; in other words, it was to pay a pithead price of 18s. 6d. per ton. That was the burden of the Company's complaint.

It had been suggested to Mr. T. Hornsby, the Chairman of the Durham Coal Sales Control Committee, that he was using his powers to extract a higher price from the Newcastle Company than he was getting from a far away customer. He had replied that that was so undoubtedly, and that the railway companies sold transport in that way; the rate per ton mile for long distance traffic was far lower than that for short distance traffic.

After quoting from the evidence at the Enquiry by the Investigation Committee in Newcastle, to show that competition between gas and coal had been discussed, and that there seemed to be a complaint that the Gas Industry was utilizing coke oven gas (even though Parliament had decided in a number of cases that that was in the public interest), Counsel said he did not ask the Tribunal to increase the London companies' prices and did not ask that the Newcastle Company should buy at lower pithead prices than the London companies; he asked only that the Newcastle Company should not be in a worse position than the London Companies, and claimed with great confidence that there was no reason and no justice in differentiating between them.

Evidence of Mr. Ridley.

Mr. *T. P. Ridley* (Secretary and General Manager of the Newcastle Company) gave evidence. He said that the Company's area included a very large district of household consumers; gas was used very largely in the working class houses of the district for both heating and cooking, and there was also a very large industrial consumption. It had been the policy during the last few years to encourage the use of gas by industrialists, and the sales of industrial gas had increased during the last few years from 30 to about 44%. There were 265,000 consumers on the books, the larger proportion of them consuming gas through penny-in-the-slot meters. There was a special tariff for gas used in large furnaces and an increase in the price of coal automatically involved an increase in the price of gas; and an increase in the price of coal also resulted automatically in an increase of the price which the Company had to pay for coke oven gas.

Corroborating the statements by Counsel concerning coal prices, he said that for export and coastwise coal there were minimum prices f.o.b., at the customary places of shipment, whereas for railborne or roadborne coal the prices were specified as at pit. Since March, 1935, there was a difference of about 1s. 9d. per ton between pithead prices and the minimum f.o.b. price. He corroborated the evidence concerning his interview with Mr. Hornsby, in which the latter had said that the price must be 5s. above the 1935 summer price (as compared with the difference of 4s. agreed with the London companies); and, in order to show that other gas undertakings in the Durham area were also concerned, letters were produced from those undertakings to show that their prices were also subject to the result of the appeal.

Asked if he could give a reason why the Newcastle Company had been loaded with a pithead price 1s. per ton higher than the equivalent pithead price for coal which was sold f.o.b., he said Mr. Hornsby had told him that the coal sold f.o.b. gave a higher return to the colliery than did the railborne and roadborne coal, and that other consumers were paying higher prices than was the Newcastle Gas Company.

Mr. Ridley added that in his opinion, but for the operation of sales control in the Durham district, he could have bought supplies of coal at a price not higher than the equivalent pithead price of the coal sold to the London companies. But in present circumstances he had no alternative source of supply.

When asked whether he had any bargaining cards in his hands at all when face to face with the Sales Committee, he replied that he had not; apart from the alternative of obtaining coal from Northumberland, he would have to go elsewhere and pay an extra 10s. or 11s. per ton for carriage.

The CHAIRMAN said he supposed it was assumed that in the absence of Government control there would have been no price maintenance in the district; but the owners might have got together in order to protect themselves.

Mr. *Ridley* was questioned by Counsel with regard to the point that the competition from the Midland amalgamated district might affect the selling price of Durham coal to London companies, and was asked whether there was any similar circumstance likely to arise in respect of his Company. He replied that there might be a slight variation by obtaining coal from Northumberland, but he agreed that in effect his Company had to pay what the Sales Committee chose to demand.

Purchases of Coke Oven Gas.

Having given evidence that a number of other gas undertakings were also buying large quantities of coke oven gas, in some cases to the extent of 100% of their sales, so that the Newcastle Company was not alone in that respect, he said that in 1937 it had paid £90,000 and £11,700 respectively to two coke oven undertakings for coke oven gas, and in 1938 the amounts paid were £88,870 and £27,446 respectively. He emphasized that the sale of the coke oven gas to the Gas Company was an important element from the coal owners' point of view.

A factor which, in addition to the price of coal, affected the price of gas was that the Company had to budget for a possible reduction in the price of coke in 1939, while the prices of some other residual products showed a downward tendency.

Giving details of the Company's coal purchases, he agreed with the figure given by Counsel of £35,000 as representing the extra cost of coal for the year 1939. There was a difference of 3s. 2·58d. per ton as between the prices quoted for 1939 and the actual price paid in 1938. The difference of 1s. in the price of coal made a difference in cost to the Company of £9,375 in respect of the coal it carbonized, and it would represent an increase of £2,799 on the cost of the coke oven gas purchased, those two figures making a total of £12,174.

The CHAIRMAN said he gathered that there was a difference of 3s. 2d. between the prices in 1938 and 1939, and the position of the Company was that even if they were relieved of the extra cost of £12,000 represented by the 1s. per ton increase, they would still have to meet an additional cost about which they did not complain.

Mr. *Ridley* agreed.

Replying to further questions by Counsel, he said that if an addition of just over 1d. per ton were made on the f.o.b. price of the gas coal for export and coastwise sale, the return to the coal owners would be the same as that obtained by adding 1s. per ton to the gas coal sold to inland consumers.

Witness also produced further figures, obtained from Field's Analysis, showing that the Newcastle Company was at a disadvantage in several respects as compared with some of the large London companies. The consumption per consumer, the sales per mile of main, and the number of consumers per mile of main were smaller in Newcastle, while the percentage of unaccounted-for gas in Newcastle was higher than in London. The Newcastle Company's profit per therm was less than that of the larger undertakings in the South of England.

With regard to a statement by the Committee of Investigation that the delivered prices paid by the Company were less than the delivered prices paid for similar coals by other gas companies situated within the Durham district and which carbonized not less than 50,000 tons of Durham coal per annum, he said that the Stockton Works were the only ones in the area carbonizing that quantity of Durham coal, and the railway carriage to those works cost more than the railway carriage to the Newcastle works.

Emphasizing that, in view of the low prices of industrial coal in the area, the prices of gas must be low in order to compete, he said that the Company claimed also that by reducing prices of industrial gas it had prevented the development of the use of oil.

Gas Undertakings' Results

Bournemouth.

Increases both in the sales of gas and in the number of consumers during the past year were reported at the annual meeting of the Bournemouth Gas and Water Company, a full account of the proceedings at which appeared on p. 591 of last week's issue of the "JOURNAL." Gas sales were up by 1·26% as compared with those of 1937, while the number of consumers increased by 3,921. The undertakings of the Brockenhurst Gas Company and the Wareham and District Gas Company, Ltd., were transferred to the Bournemouth Company on July 1 last. During the year some further capital was issued, and at the meeting the Directors were authorized to exercise the powers for the raising of additional capital conferred by the Company's Act of 1938. The dividends for the year are 7% on the maximum dividend stock and 9½% on the standard 5% sliding-scale stock, leaving a sum of £64,088 to be carried forward to the current year.

Canterbury.

As from the beginning of this year, the Canterbury Gas and Water Company are working under their new Act, which received the Royal Assent last July. This authorizes the Company to consolidate and convert the existing capital, and provides for raising more capital as required, but the Directors stated in the report which was presented at the recent annual meeting of proprietors that the Act "will make little difference in the working of the Company from the past practice." At the present time a holder is in course of erection at Sturry Road, which will improve the supply of gas in that neighbourhood. The quantity of gas sold during the past twelve months was 809,279 therms, which compares with 811,008 therms in 1937. The uniform dividend upon the total capital is 10% for the year. On the whole undertaking, the balance of revenue carried to Profit and Loss Account is £14,817, against £18,258 in 1937. There has been about £7,000 of capital expenditure during the year, leaving the Capital Account in debit to the extent of £13,668. Mr. W. A. King, who has been with the Company for 36 years (the last 25 years as Secretary), expressed his wish to retire from the latter position when the Company's new Act came into force, and it was arranged that he should resign active work immediately after the annual meeting, when, with the idea of retaining his valued services in some way, the Board proposed his election as an additional Director. The new Secretary is Mr. W. J. King, late Secretary of the Truro Gas and Water Companies, who began his business career in Canterbury.

Chichester.

The receipts of the City of Chichester Gas Company for gas during 1938 did not quite reach the figure for 1937, although there was an increase in the quantity sold of rather under 1%. The explanation is that the price of gas was lowered as from the end of the September quarter by 0·6d. per therm. The gross profit, at £6,391, shows the satisfactory increase of £849 over that of the preceding year. The total quantity of gas sold was 343,334 therms. Some £2,000 was added to capital expenditure during the year, which leaves a balance of £10,030 at credit of Capital Account. Payment of a dividend for the year at the full statutory rate will leave a balance to be carried forward of £4,632, which compares with the sum of £3,500 brought in. During the year £12,000 of 4½% preference stock was issued to meet an overdraft at the bank and for general capital purposes of the Company. The late Mr. T. N. Ritson has been succeeded in the Chairmanship by Mr. C. H. Rutter.

Eastbourne.

The quantity of gas sold by the Eastbourne Gas Company during the year 1938 was 3,352,335 therms, which is a trifle less than in the preceding twelve months, when the sales amounted to 3,354,783 therms. The Directors, in their report, state that the supply of gas in bulk to the Heathfield Gas Company, Ltd., was commenced on Oct. 1 last. A contract for street lighting at Seaford for a further period of eight years has been entered into, and in the same town a new showroom, with offices and demonstration theatre, was opened last April. The dividends for the year are £7 13s. 9d.% on the "A" stock, and £6 3s. 9d.% on the "B" stock, which will leave a balance of £1,468 to be carried forward. This is 6s. 3d.% less in each case than was paid a year ago, when the balance carried forward was £685. During the past twelve months the number of private consumers increased from 20,938 to 21,787—8,947 ordinary, and 12,840 prepayment. On Revenue Account, the expenditure is about £4,500 up, and the receipts somewhat under £5,000 higher, so that the balance carried to Profit and Loss Account is £33,445, as compared with £33,058 in the preceding year. During the twelve months there has been a net addition to capital expenditure of £12,594, and £33,294 appears as investment and loan to the Heathfield Gas Company, Ltd., and £2,984 to South-Eastern Tar Distillers, Ltd. as investment. There remained a balance of £33,624 at credit of Capital Account.

Guildford.

The accounts of the Guildford Gas Light and Coke Company show that the quantity of gas sold in 1938 was 1,856,385 therms, as compared with 1,866,888 therms in the preceding year. There is thus a very slight variation on the gas side, while the quantity of electricity sold rose from 908,237 units to 1,124,989 units. The dividends on the consolidated ordinary stock and on the electricity ordinary stock remain the same as before at 8½% for the year, with the balance carried forward £150 up, at £17,200. At the end of the year the gas and electricity Capital Accounts were in debit to the total of £46,944. A gain of about £2,500 on Gas Revenue Account receipts was almost exactly equalled by the rise in expenditure. Thus the balance carried to Profit and Loss Account is about £150 down at £20,413.

Heathfield.

The sale of gas by the Heathfield Gas Company, Ltd., during the year 1938 was 62,296 therms, as compared with 53,890 therms in the preceding year. This is an increase of 15·6% on 1937, which in its turn showed an increase of 13·77% over 1936. Out of the available balance the Directors recommend the payment for the past year of a dividend of 6% on the original ordinary shares, which will leave a balance of £343 to be carried forward to the next account. A year ago the dividend was the same, and the carry-forward was £342. The total number of consumers now supplied by the Company is 842. An agreement has been entered into for the purchase of gas in bulk from the Eastbourne Gas Company, and an 8-in. main from Horam to Horsebridge has been laid for this purpose. The manufacture of gas at the Heathfield Works has now been discontinued.

Horley.

A small falling off in the quantity of gas sold is revealed by the accounts for the year 1938 of the Horley District Gas Company. The total quantity of gas sold was 525,473 therms, which compares with 535,248 therms in 1937. At 220, the number of public gas lamps shows a small increase for the year. The revenue balance carried to Profit and Loss Account is about £120 up, at £6,461. Payment of dividends at the standard rates of 10% on the "A" capital stock and 7% on the additional "B" capital stock will leave a balance of £3,015 to be carried forward to the next account. The carry-forward a year ago was £2,997. A net addition during the year of £734 to the capital expended brings the balance at debit of Capital Account to £3,194. The amount outstanding on hire-purchase agreements has been reduced by just over £50, to £6,698.

Ilfracombe.

Presenting the accounts for the past year, the Directors of the Ilfracombe Gas Company say it is satisfactory to report that the business of the Company continues to expand. The accounts show that the total quantity of gas sold was 545,711 therms, as compared with a total of 538,720 therms in 1937. There is a slight gain in the consumption for public lighting. The balance of revenue carried to Profit and Loss Account is £4,393, against £3,752 a year ago. From the available balance of £2,234, the Directors recommend that the dividend on the consolidated ordinary stock be brought up to 6½% for the year, which is 10s.% more than was paid for 1937. As no capital expenditure was debited during the year, there remains a small sum at credit of Capital Account.

Lea Bridge.

Trade conditions have adversely affected the business of the Lea Bridge District Gas Company, whose Directors report that the sale of gas during 1938 shows a decrease of 6·11%, when compared with that of 1937, due to a large extent to a reduction in the supply for industrial purposes. The Revenue Account shows that the sale of gas in the past year actually was 5,186,285 therms, while in 1937 the total was 5,523,975 therms. Revenue was practically the same as a year ago, and there has been a saving on coal, but heavier charges for repairs and maintenance of works and plant leave the balance carried to Profit and Loss Account, at £33,495, within about £1,000 of the previous year. The dividend on the consolidated ordinary stock for the year is 8½%, which will leave a balance to be carried forward of £16,505. A year ago the dividend was the same, but the carry-forward was £20,434. There has been little change in the Capital Account, which at the close of 1938 was in credit to the extent of £75,064.

The proceedings at the forthcoming annual meeting will be fully reported in the "JOURNAL" dated March 15.

Rochester, Chatham, and Gillingham.

The report of the Directors of the Rochester, Chatham, and Gillingham Gas Company points out that the results for the past year have been affected by the fact that a bulk supply of gas has been provided for the Sittingbourne District Gas Company. The sales of gas by the Rochester Company show an increase of 7·06%, when compared with those of the preceding year. This figure, however, includes the quantity sold to the Sittingbourne Company, without which the increase is equal to 1·08%. A dividend for the year on the consolidated ordinary stock of 6½% will leave £20,363 to be carried forward to the credit of the current year. A year ago the dividend was the same; the carry-forward being £18,825. The total quantity of gas sold in the past year was 5,508,608 therms, which compares with 5,145,150 therms in 1937. In both years the price of gas was the same, and for the past year the item of "Public lighting and under contracts" is slightly up. Receipts on Revenue Account are about £12,000 higher, while expenditure is up by roughly the same amount. Thus there is only £70 difference in the balance carried to Net Revenue Account—£40,901. There is at credit of Capital Account the sum of £27,291.

Wellington (Salop).

In their report for the year 1938 the Directors of the Wellington (Salop) Gas Company state that the sale of gas shows an increase of 11·8% over that of the previous year, of which 7·4% represents gas sold in bulk to the Iron-Bridge and District Gas Company, Ltd. The actual quantity sold was 1,074,825 therms, as compared with a total of 960,655 therms in 1937. The number of consumers at the end of December last was 7,011—1,306 ordinary, and 5,705 prepayment. At the close of the previous year the consumers numbered 6,865. The dividend for the year on the ordinary stock is 7%, which will leave a balance to be carried forward of £5,190, which compares with the sum of £4,988 brought in. The gross profit carried to Net Revenue Account is £8,296, as against £8,074 in 1937. During the twelve months £9,577 was expended on a new retort-house, and this has brought the debit balance on Capital Account up to £14,290.

York.

The Directors of the York Gas Company report that the quantity of gas accounted for during the year 1938 was 4,633,334 therms; for 1937 the total was 4,782,104 therms. The balance of revenue carried to Profit and Loss Account is about £4,000 down, at £16,578. The administration fee to the United Kingdom Gas Corporation is reduced from £3,175 to £2,898. The dividend for the year of 5% on the consolidated ordinary stock will leave a balance of £6,480 to be carried forward. The carry-forward a year ago was £9,634. In spite of the expenditure during the year of upwards of £17,000 on new meters, apparatus, and slot installations, the net addition to Capital Account is only about £6,000, which brings the excess of expenditure over receipts to £35,118.

Tottenham and District Gas Company

The Annual General Meeting of the Tottenham and District Gas Company was held on Tuesday, Feb. 28, 1939, at the Chief Office of the Company, Woodall House, 658, Lordship Lane, Wood Green, N. 22—Mr. HENRY WOODALL, M.Inst.C.E. (Chairman and Managing Director), presiding.

The SECRETARY (Mr. Edward J. K. Fussell) read the notice convening the meeting, together with the Auditors' Report, and the common seal was duly affixed to the register of proprietors. The Report and Statement of Accounts were taken as read.

THE CHAIRMAN'S ADDRESS.

The CHAIRMAN, in moving the adoption of the Report and accounts for the year ended Dec. 31, 1938, said: Some of you will remember that last year I told you that the price of gas in 1922 was 11d. per therm. It was gradually reduced until in July, 1931, it became 8·6d. per therm, and has since remained unaltered. Many gas Companies increased the price of gas on account of the voluntary 1s. a ton paid by the Gas Industry to enable better wages to be paid to the miners, and also on account of the rise in our own men's wages and the cost of materials. We did not do this because we believe in keeping the price as low as possible; and also an increase would have meant a reduction in our Co-partners' bonus and our Shareholders' dividends. Until last year we have, for years, had a surplus after meeting all charges; we budgeted for a small surplus last year, and our estimate would have been justified had we had normal weather, but you know last year was the mildest we have experienced for a long period. Your Directors do not regret their policy which has been to the advantage of consumers, co-partners and shareholders alike.

We have increased the price by 1d. per therm to meet the very serious rise in the price of coal which came into operation, as far as we are concerned, on Jan. 1 this year. The effect of the increase will be that the 67,000 consumers by ordinary meters will have to pay a little over ¼d. a day extra, and the 116,000 prepayment consumers a little under ¼d. a day.

The Accounts.

Turning to the accounts, you will see that the capital is increased by half a million pounds, largely due to the purchase of the Southgate Company, to which I will refer later. The capital expenditure on land, buildings, &c., less depreciation, was £93,815.

In the revenue account there is nothing special to which I need call your attention except to point out that under the "Sale of Gas" there is a reduction of £8,059, although the output of gas has increased by 0·80%. This is due largely to a reduction in the differential prices in the outer areas, and, to a smaller extent, to the increased quantity of gas sold at a low price to large consumers.

In the Profit and Loss Account you will see that, after paying the usual dividends, and transferring £1,556 to the Reserve Fund, the carry-forward will be £40,531, a reduction of £16,483.

We might have charged to the Reserve and other funds the actual deficit of the year—namely, £14,927—but preferred to reduce the carry-forward, which still stands at the substantial figure of £40,531.

Turning to the Reserve, Special Purposes, Renewal, and Capital Redemption Funds, you will see that the total addition to the four Funds is £53,686. Most of the addition is due to the transference of the Southgate Gas Company Funds to our own, but in every case we have added the interest. The Funds are practically all invested outside the Company.

Advantages of Basic Price.

Last year we promoted a Board of Trade Order, known as the Tottenham and District Gas Order, 1938, to sanction the amalgamation of the Southgate Company with this Company and to adopt a basic price instead of a standard price. The Order became effective on July 1 last. The basic price, for which we asked 11d. per therm, was granted, and it is interesting to note that the dividend authorization resulting from the application of the basic price is practically the same as the dividend authorization under the old standard price, which is as it should be. The two chief advantages of the basic price are:

(1) That under it whatever the price charged a dividend of 5% can be paid if earned; and

(2) That under the basic price companies are not at such a disadvantage if they sell gas at a specially low rate for industrial and other purposes.

In order to compete with electricity, oil, &c., it is essential that gas companies should be able to charge a competitive price without being at a disadvantage with regard to dividend payable. The basic price was first introduced by the late Dr. Carpenter in the South Metropolitan Gas Act, 1920, and is one of the many things for which the Gas Industry remembers and thanks him.

The amalgamation with the Southgate Gas Company will undoubtedly prove to the advantage of all concerned. The Southgate district is a compact one, covering an area of about eight square miles, and the increase in sales has been more rapid recently in the Southgate area than in the larger Tottenham one.

During last year we purchased all the shares in the St. Margaret's Gas Company. This is a very small Undertaking, but has a Statutory area of supply of 10½ square miles, which adjoins our own and rounds off our boundaries. We have closed down the somewhat antiquated works at St. Margaret's and supply direct from Hertford. Already sales of gas and appliances show a substantial increase. We now supply gas over an area

of nearly 450 square miles. In this figure is included the area of the Dunstable Gas and Water Company, which we control.

The demand for gas now depends very largely on climatic conditions. During the week preceding Christmas we experienced the most severe spell of cold weather since February, 1929, and the sales during that period exceeded all records. Increases in output on individual days were as much as 27% over the corresponding days of the previous week, and on one day the output exceeded by 15% the highest previous record. On a few days the gas sent out in our new area at Southgate was 60% more than on the corresponding days of the previous year. When you consider that gas is a fuel which is on tap, and all the consumer has to do is to turn on the tap and take as much gas as he may require, you will appreciate the demands made upon the staff which I am glad to say were satisfactorily met.

The use of gas in industry is rapidly extending. Twenty-five years ago more than half the consumption was in the dark hours from 6 p.m. to 6 a.m. Now nearly 70% of the output is used in the daytime.

The growth of our business has rendered it necessary to increase our storage capacity, and we have two gasholders, one of 1 million and another of 2 million cu.ft. capacity, in course of construction and nearing completion.

It is our aim to give the best possible service in public lighting, and I think I may claim that our efforts are appreciated. The number of public lamps continues to increase and now stands at the handsome total of 12,190.

Record Sales of Appliances.

The number of appliances sold again constitutes a record, their value represents an increase of 5% on those sold in 1937—a very satisfactory return—particularly when the uncertainties of last Autumn and their effect on trade are taken into consideration. The total sales through our showrooms in 1935 amounted to £140,000, and last year to £270,000, which gives you an indication of the growth and the magnitude of the business.

We have contracted for practically all our coal for this year. The prices are artificially high on account of the advantage taken by the coal industry of legislation. There have been one or two appeals by gas undertakings as to high prices charged, but no reduction has been obtained. There may be some consolation in the belief that prices have reached their peak and that when we enter the market for our next year's requirements we may find conditions a little easier. The main defect of the legislation as to coal is that the consumer's position was hardly considered, and it appears to me that consumers of coal should combine to oppose the unfair conditions imposed by the coal owners, supported as they are by legislation which needs drastic amendment.

Coke, as you will see from the Accounts, is the most important financially of our residuals, and the revenue for coke and breeze exceeded £200,000 last year. It is growing in favour as a smokeless fuel; not only is it used in domestic boilers but in the open grate. During last year we supplied 3,075 coke fires ignited by gas and their use is growing. The efforts of the Smoke Abatement Society are attracting the attention of people in high authority such as the Minister of Health and the Chairman of the London County Council, both of whom I heard recently make pronouncements in favour of smokeless fuel, of which coke is one of the most important. We give discounts to consumers making yearly contracts with us for coke and now have over 25,000 of these contracts in operation.

Air Raid Precautions.

It would, I am sure, be your wish that reasonable and proper precautions should be taken for protecting our workpeople and important pieces of plant and machinery. The necessary plans have been prepared and the work involved is proceeding. The expenditure which will be incurred is considerable and unremunerative. We cannot, however, afford to neglect precautions which may be of vital necessity in case of emergency. We have, in addition, prepared a very complete Register of all employees of the Company to ensure that, as far as possible, every employee may be used to the best advantage in case of need. The Register reflects great credit on those who prepared it. It has been both useful and interesting. For one thing, it has enabled us more easily to decide on our key men. The key men must be men of knowledge and courage. In case of attack they will have to keep cool heads and stout hearts. The turning of a wrong valve in an emergency might well lead to disaster. It would be helpful to us in keeping these men if they were provided with some uniform or suitable badge to show they were serving their King and Country to the best of their ability.

The total number of our employees already engaged in or pledged to perform emergency duties is 587 men and 8 women, representing 22% of the personnel of the Company. There has been no canvassing of any sort among the employees.

Pension Funds.

You have the figures of the Co-partners' Pension Funds before you and you will see that they are very soundly invested. The present value of the Assets of the three Funds is over £500,000, and the excess of income over expenditure last year was £38,987. We have actuarial valuations of the Funds every five years, and we expect shortly to be able to reduce the Company's annual contribution.

With regard to the future, there is reason to be hopeful. We have a large and steadily developing area of supply. Our consumers are increasing, last year by 6,113. The sale of appliances show a very satisfactory growth.

It was shown during the cold spell at the end of December that weather conditions being favourable there is a large potential increase in output. A very large amount of research work is being undertaken with excellent results. Those of us who remember the development of the Gas Industry in the last fifty years cannot fail to be encouraged and impressed by the way many difficulties have been overcome and improvements made in every branch of our business. Never have we had in charge of our undertakings more highly skilled engineers, chemists, and commercial men.

One ought not to forget our publicity departments which turn out from time to time attractive slogans emanating from the incomparable Mr. Therm. The makers of apparatus from year to year show great improvements in both the efficiency and appearance of their products.

Given a more settled world there is every reason to believe that our old-established Industry will continue to progress and prosper.

The CHAIRMAN then moved:

> "That the Report of the Directors and Statement of Accounts for the year to Dec. 31, 1938, be received and adopted and that the Report be entered on the Minutes of the proceedings of this day."

The DEPUTY-CHAIRMAN (Mr. A. E. Broadberry, M.Inst.C.E.) seconded the resolution, which was carried unanimously.

In reply to a Stockholder, who asked what effect the increase in the price of gas would have upon the dividend, the CHAIRMAN said that the dividend for the current year would probably be reduced from the figure for the year under review, but the amount of the reduction could not be ascertained until the accounts for the current year had been made up.

Dividends.

The CHAIRMAN then moved:

> "That a Dividend at the rate of 6%, 5½%, and 5% per annum respectively on the Preference Stocks, and £6 15s.% per annum on the Ordinary Stock, all less income-tax, be declared for the half-year ended Dec. 31, 1938, payable on March 8 next, and that the Dividend Warrants be sent to the Proprietors by post."

This resolution was seconded by the DEPUTY-CHAIRMAN and carried unanimously.

Re-Election of Directors and Auditors.

The CHAIRMAN thereafter proposed the re-election to the Board of Mr. Harold G. Palmer, being one of the Directors retiring by rotation. Mr. Palmer, he observed, had been a Director of the Company for some considerable time, and he was sure the proprietors would be as pleased to re-elect him as the Board would be to have him continue as a colleague.

The resolution was seconded by the DEPUTY-CHAIRMAN and carried unanimously, Mr. PALMER briefly acknowledging his re-election.

The CHAIRMAN then moved the re-election of Mr. Thomas Hardie, M.Inst.C.E., being the other Director retiring by rotation. Everybody in the Gas Industry, said the Chairman, knew the name of Hardie, and he was a very useful colleague.

This resolution was also seconded by the DEPUTY-CHAIRMAN and carried unanimously, Mr. HARDIE returning thanks.

On the proposition of Mr. J. TAYLOR, seconded by Mr. J. A. WILLIAMS, Lieut.-Colonel W. C. Smith, D.S.O., M.C., F.C.A., was appointed an Auditor of the Company in succession to Mr. John Eve, F.C.I.S., F.L.A.A. The CHAIRMAN remarked that Mr. Eve had been an Auditor of the Company for 25 years, and had been a very careful and thorough Auditor, whose services they were very sorry to lose.

Vote of Thanks.

Capt. H. F. WILKINSON proposed that the best thanks of the proprietors be given to the Chairman, Directors, and Auditors, and also to the Officers, staff, and workmen for their services to the Company during the past year. It would be agreed, said Capt. Wilkinson, that in their Chairman and Directors they had a capable body of business men well able to look after the affairs of the Company, who had carried out their duties during the past twelve months—which had been a very difficult period—in a highly efficient manner. They all appreciated their services and also those of their Auditors. They also expressed their appreciation and thanks to the Officers and staff of the Company. In them they had highly skilled men, without whom, in a business such as theirs, they would not get very far no matter how good the Directors. In this vote of thanks they also included all the work-

men, who were a fine body of men who carried out all their duties with courtesy and efficiency.

The resolution was duly seconded and carried unanimously.

The CHAIRMAN, responding, said they much appreciated the vote of thanks and were very glad that it included the staff and workmen. Considerable demands had been made upon the latter, not only during the exceptional period of cold weather at Christmas but also during the international crisis in September. They had carried out their work efficiently and without complaint. In their workmen they certainly had a fine lot of men, and the Directors had full confidence that anything they did would be done well. They were very grateful to them and glad that the proprietors had accorded them this vote of thanks.

This concluded the proceedings of the Ordinary General Meeting.

Extraordinary General Meeting.

An extraordinary General Meeting immediately followed for the purpose of passing a resolution sanctioning the raising of additional capital and the exercise of the borrowing powers of the Company in accordance with the special Acts and Orders of the Company regulating such matters, and authorizing the raising of such capital and the exercising of such borrowing powers by the Directors.

The SECRETARY read the notice convening this meeting, and the CHAIRMAN briefly explained the purpose of the resolution and the intentions of the Board in this connexion.

The resolution was seconded by the DEPUTY-CHAIRMAN and unanimously agreed, this terminating the business of the meeting.

Cambridge University and Town Gas Light Company

The Ordinary General Meeting of the Shareholders was held at the Company's Offices in Sidney Street on Feb. 24, the CHAIRMAN, Mr. J. F. Cameron, presiding.

In the course of his speech moving the adoption of the report, the CHAIRMAN said:

With this meeting before me, I have naturally been watching the reports of other gas companies published within the last two or three weeks, and, if I may compare the results of our relatively small undertaking with those of the leaders of the Industry, it is noticeable how closely our experience in the past year corresponds with theirs, in that our make of gas for 1938 is 1% less than for 1937.

Temperature and Sales.

On other occasions in the past I have commented on the connexion between temperature and sales—the higher the one the lower the other. The variations due to weather usually cancel out in the course of the year, but they did not do so in 1938. It is difficult to remember the weather of a year ago, but the records remain. The spring of 1938 was particularly mild, especially in March, when each day was warmer than the corresponding day of 1937, and the average temperature was 10° higher. Again, November was a warm month for November, and the average temperature was 7° higher than for that month in 1937. A cold snap came last Christmas time, and sales bounded up. It came with great suddenness, and so put a heavy strain on our staff employed on distribution and at the works, to which, I am glad to say, they responded with willingness and efficiency. The cold weather came, however, after the meter headings of mid-December, and though, of course, it improved the figure for gas made in the year, it came too late to affect the figure for gas sold.

New Carbonizing Plant.

The most important step taken during the year has been the signing of the contract for a new carbonizing plant. It was only after very careful consideration that we decided to place a contract with the Woodall-Duckham Vertical Retort and Oven Construction Company, Ltd., for one of their new static vertical retort plants. The new installation, capable of producing approximately 1½ million cu.ft. of gas in 24 hours, is being erected in No. 2 Retort House, which will be reconstructed accordingly. The plant will be the most up-to-date type in the country and will comprise 10 retorts each carbonizing about eight tons of coal in 24 hours.

The special feature of the plant is that the red hot coke is lowered into a cooling chamber situated immediately below the carbonizing retort; this obviates the necessity of quenching the coke with water, which creates a dust and steam laden atmosphere.

Special arrangements are also being made in respect of the charging of the retorts with coal, and in the whole of the negotiations we have borne in mind not only the cost of production, but our desire to have a plant which would give us the maximum of atmospheric cleanliness and which would improve the working conditions for the operating staff. The cost of this retort house, together with the cost of the auxiliary plant, will be some £55,000. Towards this sum we raised £30,000 4% debenture stock in the course of 1938. Provision for a further £25,000 is required, and, as the new retort house replaces an old one, we hope to meet this sum, or at least greatly to reduce it, by payments, necessarily spread over a number of years, from the contingency fund.

During the year several improvements have been carried out at the works, and all the plant has been maintained in an efficient state of repair.

There has been considerable activity in the distribution department, and the work of laying mains in connexion with the Corporation's Newmarket Road housing site is still proceeding. During the year we have laid nearly six miles of mains, and our total length of mains at the end of the year was 181 miles.

5,000 at Lectures.

During the past year nearly 5,000 people have attended lectures here, and I feel sure that these lectures and the demonstrations we have held in various parts of the town do much to improve the conditions and to ease the burden of domestic work.

During the year the number of consumers has risen from 26,390 to 27,010, an increase of 620, and the net increase in appliances has been: Cookers 788, gas fires 1,229, water heaters 746, refrigerators 61, miscellaneous 82; a grand total of 2,906.

I think it is worthy of mention that during the year we have been successful in obtaining orders for bulk supplies of gas refrigerators and water heaters to the Causewayside flats in Fen Causeway and the St. Regis flats in Chesterton, and that these orders were obtained by the efficiency of our sales staff in the face of keen competition.

Increased Price of Gas.

From the revenue account it will be noticed that the cost of coal, &c., shows an increase of £1,610 following an increase in the price of coal. As from July 1 it rose on the average by 2s. 5d. per ton. As a result of this, together with other increased expenditure in materials, it was unfortunately necessary to increase the price of gas by ¼d. per therm as from the readings of the meters in June.

It is pleasing to note that the revenue from residuals has been maintained, and the decrease in revenue from benzole has been offset by a substantial increase in revenue from tar.

A.R.P. Training.

This is neither the time nor the place to deal with questions of international relations, but, like others in the community, we are taking steps to provide air raid precautions. In this connexion I may mention that a member of the staff was sent to the Government School in Falfield, Gloucester, and has qualified as a first-class instructor in A.R.P. He is now engaged in giving training to others at the works.

We have applied for an order for extension of our area of supply to include the parishes of Barton, Dry Drayton, Haslingfield and Madingley in the rural district of Chesterton, and the parishes of Duxford, Pampisford and Whittlesford in the rural district of South Cambridgeshire, and the draft order is now being considered by the Board of Trade. This means that we are seeking to extend our powers so that if and when a suitable opportunity occurs we may use them. It does not mean that we necessarily contemplate an immediate extension to these districts.

Thanks to Staff.

In conclusion, it is a pleasure again to thank Mr. Rioch and his staff both at Sidney Street and the works for the care and attention which they give to the business of the Company.

The retiring Director, Major Hamilton McCombie, was re-elected, the Chairman speaking of Major McCombie's special knowledge which was much appreciated outside Cambridge. He had just been made a member of the Research Committee of The Institution of Gas Engineers.

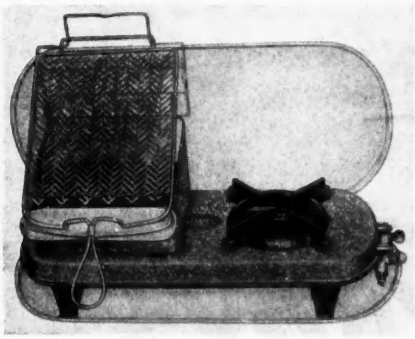
The report was adopted and the payment of the dividend at the usual rates was agreed to.

TRADE NEWS

What the manufacturers are doing by way of new and improved appliances, plant, and processes.

The "Elton" Gas Hotplate and Grill.

Messrs. W. & H. Wilson, Ltd., have brought out a new gas hotplate, the "Elton." It consists of a pressed steel porcelain enamelled frame in grey, green, or blue gun-mottle finish, having cast iron pan supports and two drilled ring burners for quick boiling. There is a white enamel baseplate and backplate.



Wilson's "Elton" Hotplate.

For this hotplate a novel grill and toaster has been designed. This takes the form of an open enamelled box having brackets attached to the outside of the back into which slides the toasting frame to serve as support for the perforated grilling grid. The handle of the grid rests on a trough which hooks on to the front of the box. A corrugated perforated grate fits inside the box and rests upon the pan support of the hotplate. When the gas is ignited this becomes red-hot and radiates heat on to the meat resting on the perforated grilling grid above. Grease formed during grilling drains down the sloping grid into the trough.

Main's New Cooker Catalogue.

The striking new "Cabinet" cooker naturally takes pride of place in R. & A. Main's recently issued cooker catalogue for 1939. This model, together with another new cooker (the 527), was described and illustrated in our B.I.F. Supplement. The new catalogue maintains the high standards which have been set by its predecessors, in regard to both layout and photography—the illustration of Main cookers in typical kitchen settings being one of the attractive features of the publication. Some of the reproductions are printed in actual colours, which greatly enhance the general effect and show how the firm's wide range of standard finishes provide a choice of cooker to harmonize with any kitchen colour scheme.

There is a special section on hotplate design, followed by a note on the "P.R." hot closet, which can be fitted to the cooker or separately on the kitchen wall. Several pages are devoted to large-scale cooking apparatus, while another section deals with the "Simplite" cooker lighter—though this accessory is not, of course, required on the new "Cabinet" cooker, which is fitted with flash ignition on the hotplate.

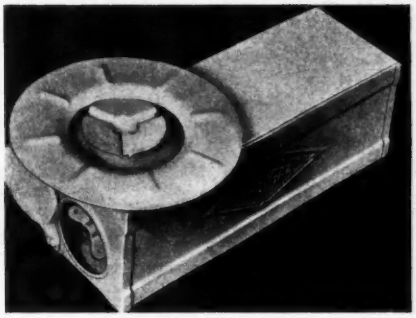
Evolution of Parkinson Appliances.

The evolution of "Parkinson" appliances is the subject of an interesting coloured folder recently produced by the Parkinson Stove Company. The folder when opened shows on one side typical Victorian domestic scenes alongside the gas appliances of those days; on the opposite side are the modern counterparts. "The Gas Industry," the folder states, "may well be justified in reviewing with pride its amazing progress in the competitive field of public utility." It is a well-known fact in the Gas Industry that the Parkinson Stove Company have participated to the full in that "amazing progress," with which the name of Parkinson has been associated since the early days of the nineteenth century.

A Portable Safety Stove.

We have received from the Butane Light and Heat Company, Ltd., particulars of a portable safety stove—the "Babygas"—which they are marketing. The stove consists of a light but strong steel box—size 3¾ in. × 4 in. × 11 in. only. Lying the full length of the box is a cylinder containing the gas supply (butane). At one end of this, and easily accessible through a hinged flap at the end of the box, is the control tap. To prepare for use it is necessary only to open the lid and take out the burner, insulating plate, and the ring support. The lid is then closed and the parts fitted into holes provided in the lid. The whole operation takes only a few seconds.

The exchange of empty cylinders for full ones is made on payment of the price of the gas content only; and this price, we are informed is uniform throughout England.



"Babygas" Portable Stove.

The gas used is commercial butane, and a "Babygas" cylinder contains 1·1 lb. weight of gas in liquid form at a pressure of only 23 lb. to the sq.in. This quantity gives 8 cu.ft. of gas with a heating value of 3,100 B.Th.U. per cu.ft. The total heating value of a fill is, therefore, 25,000 B.Th.U.

George Wilson Gas Meters, Ltd.: Scottish Representative.

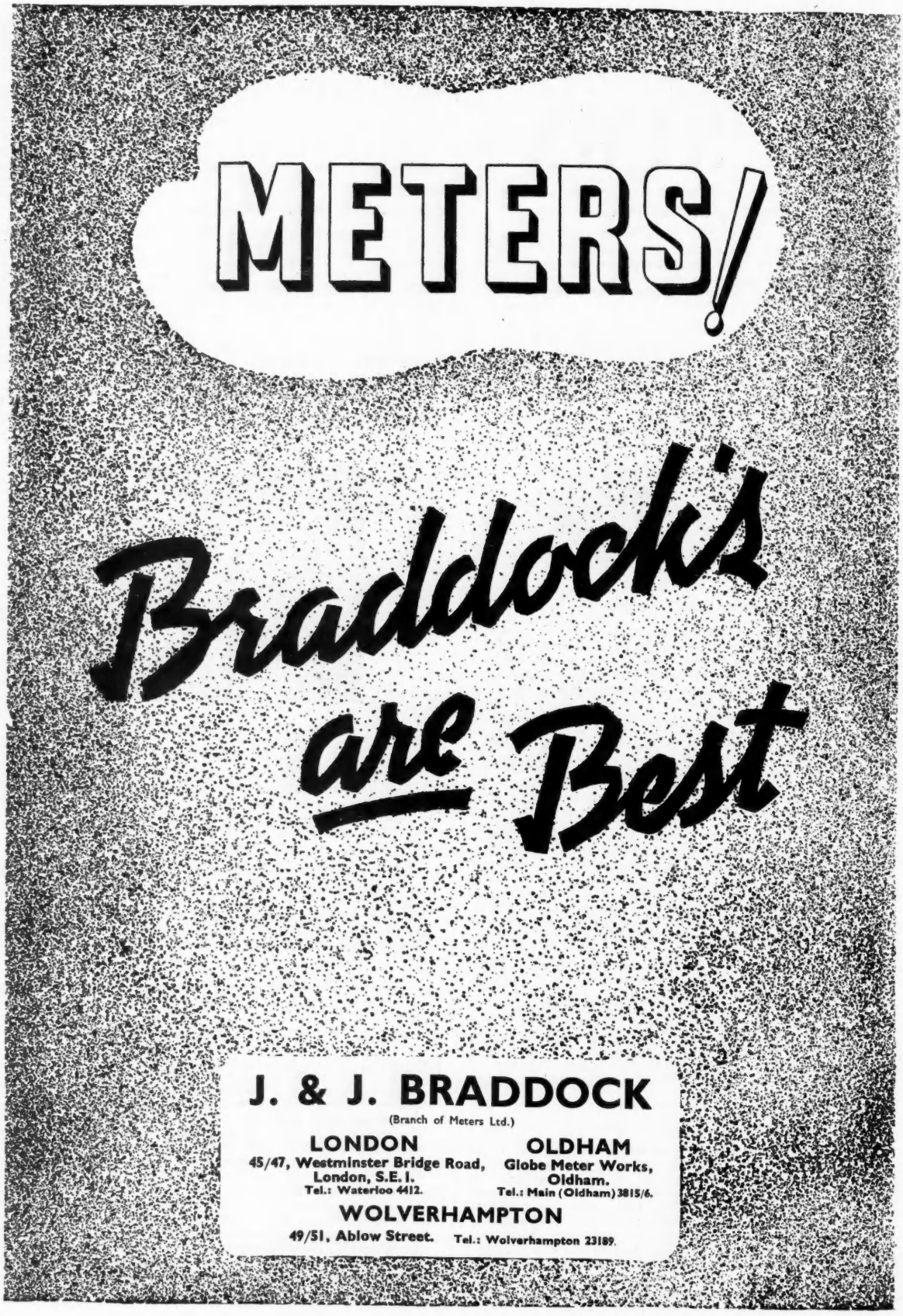
Mr. F. P. Watt has been appointed by Messrs. George Wilson Gas Meters, Ltd., to represent their interests in Scotland. Mr. Watt is very well known in the Gas Industry.

A.R.P. Notes

Oldham Considers Interlinking.

The Oldham Gas Committee has had under consideration a scheme for securing connexions with the adjoining districts to meet emergency conditions. Arrangements have been made with Manchester, each authority to do the necessary work on its side of the boundary line. The Oldham Gas Engineer, Mr. F. Greenhalgh, reported at the last meeting of the Oldham Committee that Ashton did not wish to enter the Oldham scheme, but Rochdale wanted such an arrangement. It was a question of the amount that Oldham were willing to pay towards the cost. In the event of an emergency Oldham could not expect to receive as large a supply of gas from Rochdale as from Manchester. The whole cost of making the necessary connexions with Rochdale was £7,000.

Providing the Government was prepared to pay half the cost, the Committee offered to agree with Rochdale on the connexions being made on a fifty-fifty basis.


METERS!
Braddock's are Best
J. & J. BRADDOCK
(Branch of Meters Ltd.)
LONDON
45/47, Westminster Bridge Road, London, S.E.1.
Tel.: Waterloo 4412.
OLDHAM
Globe Meter Works, Oldham.
Tel.: Main (Oldham) 3815/6.
WOLVERHAMPTON
49/51, Ablow Street. Tel.: Wolverhampton 23189.

Markets and Manufactures

Current Sales of Gas Products

The London Market

March 6.

There are no changes to report in the London market for Tar Products, values remaining as follows:

Pitch, nominal, at about 28s. per ton f.o.b.
Creosote, about 3¼d. to 3¾d.
Refined tar, 3¾d.
Purg toluole, about 2s. 3d.
Pure benzole, about 1s. 9d.
95/160 solvent naphtha, 1s. 7d. to 1s. 8d.
90/160 pyridine, 10s.
All per gallon naked at makers' works.

The Provinces

March 6.

Crude Gas-Works Tar, 12s. to 17s.

To avoid misunderstanding, it is necessary to state that the above price is not claimed to represent a market value. It is a price worked out from week to week upon a system which has been used for many years as a basis for the fixing of certain contracts for crude tar of varying qualities in different areas.

The average prices of gas-works products during the week were: Pitch—East Coast, 29s. to 30s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 29s. to 30s.* Toluole, naked, North, 1s. 7½d. to 1s. 9d. Coal tar, crude naphtha, in bulk, North, 7¾d. to 8¼d. Solvent naphtha, naked, North, 1s. 4½d. to 1s. 5d. Heavy naphtha, North, 1s. 2½d. to 1s. 3d. Creosote, *ex* works, in bulk, North, liquid and salty, 3⅞d. to 4⅛d.; low gravity, 4d. to 4½d. Carbolic acid, 60's, 1s. 7d. to 1s. 10d. Naphthalene, £13 10s. to £16. Salts, 70s. to 75s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal; "B" quality unsaleable. Heavy oil: Unfiltered anthracene oil, min. gr. 1,080, 4¾d. to 4⅞d.; filtered anthracene oil, min. gr. 1,080, 5¼d. to 5¾d.; heavy tar oil, gr. less than 1,080, 4¼d. to 4¾d.

*** All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.**

Scotland

GLASGOW, *March* 4.

Market continues difficult with makers' prices practically unchanged during the week.

Crude gas-works tar.—The actual value is now round 31s. to 33s. per ton *ex* works in bulk.

Pitch of vertical quality can be secured at 21s. to 22s. per ton f.o.b. for export and round 20s. per ton *ex* works in bulk for home trade.

Refined tar.—For home consumption prices are unchanged at 3¾d. to 4d. per gallon, but for export competition is keen at round 2¾d. to 3d. per gallon, both into buyers' packages at makers' works.

Creosote oil is uncertain, makers' quotations to-day being as under: Specification oil, 3½d. to 3¾d. per gallon; low-gravity, 4¼d. to 4½d. per gallon; neutral oil 3¾d. to 4d. per gallon; all *ex* works in bulk.

Cresylic acid.—Plentiful supplies are available, with prices nominal as follows: Pale, 97/99%, 1s. 2d. to 1s. 3d. per gallon; dark, 97/99%, 1s. to 1s. 1d. per gallon; pale, 99/100%, 1s. 4d. to 1s. 7d. per gallon; all *ex* works in buyers' packages.

Crude naphtha is steady at 5½d. to 6d. per gallon *ex* works in bulk, according to quality.

Solvent naphtha.—90/160 grade is 1s. 3½d. to 1s. 4d. per gallon and 90/190 heavy naphtha is round 1s. 1d. to 1s. 1½d. per gallon.

Motor benzole is 1s. 3d. to 1s. 4d. per gallon.

Pyridine.—90/160 grade is 8s. 6d. to 9s. 6d. per gallon, and 90/140 grade is 9s. 6d. to 10s. 6d. per gallon.

Benzole Prices

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole..	0	9½	to	0	10	per gall. at works
Motor „ ..	1	3	„	1	3½	„ „ „
90% „ ..	1	4	„	1	4½	„ „ „
Pure „ ..	1	8	„	1	8½	„ „

Contracts Advertised To-Day

Benzole Extraction and Recovery Plant.
Birkenhead Gas Department. [p. 686.]

Brass Cocks.
Sowerby Bridge Gas Department. [p. 686.]

Coal.
Milford Haven Gas Department. [p. 686.]
Oldbury Gas Department. [p. 686.]

Galvanized Tubes and Fittings.
Milford Haven Gas and Water Department. [p. 686.]

Lubricating Oils.
Sowerby Bridge Gas Department. [p. 686.]

Mainlaying.
Spenborough Gas Department. [p. 686.]

Meters.
Milford Haven Gas and Water Department. [p. 686.]

Pipes and Specials.
Spenborough Gas Department. [p. 686.]

Resetting Retorts.
Bexhill Gas Department. [p. 686.]

Import Duties Advisory Committee

The Import Duties Advisory Committee give notice of an application for an increase in the import duty on wooden fittings not exceeding 1¼ in. in thickness, of a description commonly used as electrical or gas fittings and of a diameter not exceeding 5 in. when round, or of a length not exceeding 7 in. when rectangular. Any representations which interested parties may desire to make in regard to this application should be addressed in writing to the Secretary, Import Duties Advisory Committee, Shell-Mex House, Strand, W.C.2, not later than March 23, 1939.

PROTECT WITH

METROTECT

a bituminous paint producing a pleasant satin black finish with highly waterproof and anti-corrosive properties.

Protects steel-work which is continuously or periodically immersed in water. Does not become brittle on prolonged atmospheric exposure. METROTECT flows freely under the brush and can be applied quickly and without effort even in cold weather.

Prices and further particulars from—

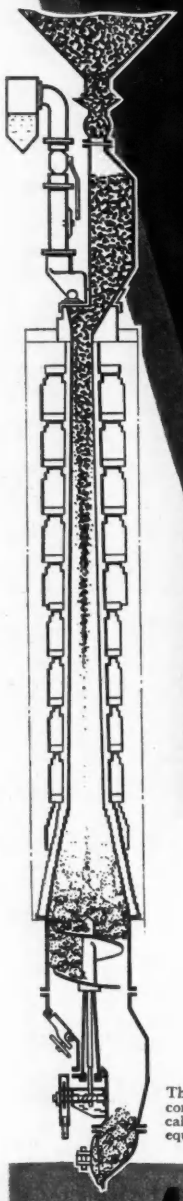
SOUTH METROPOLITAN GAS CO.

PRODUCTS DEPARTMENT,
REGIS HOUSE,
KING WILLIAM STREET,
E.C.4.

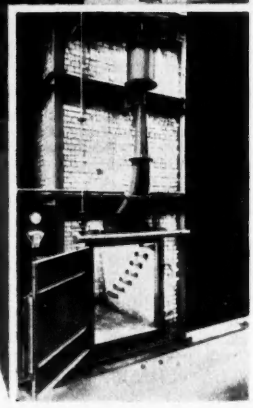
WEST'S

Three installations of Glover-West vertical retorts, with coke-grading and waste-heat recovery equipment, at the Cottesloe gasworks of the Johannesburg Municipal Gas Department. and *(below)* step-grate producer equipped with steam-jet air injector to facilitate the burning of small coke and breeze under pressure—a view in the Glover-West vertical retort house at the Meadow Lane works of the Leeds Corporation Gas Department.

Carbonizing Plants



The Glover-West continuous vertical retort and equipment.



- Increased capacity in relation to ground area covered.
- Output readily adjustable to meet fluctuating demands.
- High yields of gas and coke with low maintenance costs.
- Clean working conditions within the retort house.
- Modern building design and smokeless operation.

WEST'S GAS IMPROVEMENT COMPANY, LTD.

MILES PLATTING, MANCHESTER 10 & COLUMBIA HOUSE, ALDWYCH, W.C.2

Glover-West Vertical Retorts

AND WESTVERTICAL CARBONIZING CHAMBERS

434 PLANTS BUILT OR ORDERED IN 24 COUNTRIES

GAS STOCKS AND SHARES

The Account on the Stock Exchange closed on Friday last under cheerful conditions. An increase in the volume of business at rising prices was the experience in most sections. Gilt-edged securities were steady throughout and closed fractionally higher on the week. The demand for home rails continued and despite some profit-taking prices again rose—L.M.S. 1923 preference showing good improvement. The industrial section broadened out considerably and prices rose over a wide range of securities. Oil and rubber shares were active, the latter on the increase in the price of the commodity, while the reduced quota gave a fillip to tea shares. South African mining shares also closed firmer.

Gas stocks and shares were fairly active and prices on the whole well maintained. There were a few weak spots, however, and among these was the further fall of 5 points in Commercial to 60, at which price the yield on a 4½% dividend basis works out at £7 10s.%. British ordinary declined 2 points to 132¼ and South Metropolitan ordinary 1 to 99. The only rise of note was that of Alliance and Dublin, which closed 5 points higher at 140.

The reports of a large number of annual meetings have now been received, and it is gratifying to note that despite the unseasonable weather of 1938 many undertakings were able to record satisfactory increases in gas sales—the Metropolitan and Suburban Companies with few exceptions were not so fortunate—also large additions to the number of consumers and appliances sold, the latter reaching record figures in a number of cases. Holders of gas stocks, therefore, can be assured that on the sales side undertakings are pursuing a most energetic policy while at the same time, with modern developments, keeping working costs within economic bounds. Unfortunately, due to circumstances entirely beyond their control, companies are confronted by extra coal costs, necessitating increases in the price of gas to consumers which in some cases will bring about a small reduction in the rate of dividend for the current year. It is probable, however, that when next in Parliament many companies will endeavour to obtain a revision of their existing basic or sliding scale prices in order to meet the altered circumstances.

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations March 3.	Rise or Fall on Week.
1,767,439	Sept. 5	8	8	Alliance & Dublin Ord. ...	135—145	+5
374,000	Dec. 19	4	4	Do. 4 p.c. Deb. ...	93—98	...
734,733	Nov. 7	5	5	Asscd. Gas & Water U'd'cts Ord.	17/—19/—	...
500,000	,,	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	19/—21/—	...
444,389	,,	4	4	Do. 4 p.c. Red. Cum. Pref.	19/—21/—	...
296,523	,,	4	4	Do. 4 p.c. Irred. Cum. Pref.	16/—18/—	...
500,000	Sept. 5	3½	3½	Do. 3½ p.c. Red. Deb. ...	93—98	...
560,070	Feb. 20	7	7	Barnet Ord. 7 p.c.	155—160*	...
300,000	Oct. 10	1/9⅔	1/4⅔	Bombay, Ltd.	22/—24/—	—/6
180,435	Feb. 20	9¼	9¼	Bournemouth sliding scale ...	192—202*	...
690,526	,,	7	7	Do. 7 p.c. max. ...	155—160*	...
493,960	,,	6	6	Do. 6 p.c. Pref. ...	128—133*	...
50,000	Dec. 19	3	3	Do. 3 p.c. Deb. ...	75—80	...
362,025	,,	4	4	Do. 4 p.c. Deb. ...	95—100	...
335,000	,,	5	5	Do. 5 p.c. Deb. ...	113—118	...
357,900	Feb. 20	7½	7½	Brighton, &c., 6 p.c. Con. ...	141—146*	...
659,955	,,	6⅔	6⅔	Do. 5 p.c. Con. ...	124—129*	...
205,500	,,	6	6	Do. 6 p.c. 'B' Pref.	125—130*	...
855,000	Sept. 19	8	7	British Ord.	130—135	—2
100,000	Dec. 19	7	7	Do. 7 p.c. Pref.	138—143	...
350,000	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	112—117	...
120,000	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
450,000	,,	5	5	Do. 5 p.c. Red. Deb. ...	100—105	...
450,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
100,000	22 May '33	6	4	Cape Town, Ltd.	1—2	...
100,000	6 Nov. '33	4½	4½	Do. 4½ p.c. Pref. ...	1—2	...
150,000	Dec. 19	4⅔	4⅔	Do. 4⅔ p.c. Deb. ...	60—70	...
626,860	Feb. 6	6	6	Cardiff Con. Ord.	116—121	...
237,860	Dec. 19	5	5	Do. 5 p.c. Red. Deb. ...	103—108	...
98,936	Sept. 19	2/—	2/—	Colombo Ord.	1¼—1⅜	...
24,510	,,	1/4⅔	1/4⅔	Do. 7 p.c. Pref. ...	22/6—24/6	...
739,453	Oct. 10	—/11·48	—/11·48	Colonial Gas Assn. Ltd. Ord.	16/6—18/6	...
296,144	,,	1/3·30	1/3·30	Do. 8 p.c. Pref. ...	23/6—25/6	...
1,775,005	Jan. 23	5	4	Commercial Ord.	55—65	—5
140,000	Feb. 6	§13/4	4	Do. 4 p.c. Red. Pref. ...	95—100	...
620,000	Dec. 5	3	3	Do. 3 p.c. Deb. ...	66—71	...
286,344	Feb. 20	5	5	Do. 5 p.c. Deb. ...	110—115*	...
200,000	,,	§8⅔	4	Do. 3⅔ p.c. Red. Deb. ...	95—100*	...
807,560	Feb. 20	7	7	Croydon sliding scale ...	133—138*	...
644,590	,,	5	5	Do. max. div.	98—103*	...
620,385	Dec. 19	5	5	Do. 5 p.c. Deb. ...	112—117	...
239,000	Feb. 6	5	5	East Hull Ord. 5 p.c. ...	93—98	...
186,155	Feb. 6	6	6	East Surrey Ord. 5 p.c. ...	113—118	...
176,211	Dec. 5	5	5	Do. 5 p.c. Deb. ...	112—117	...
250,000	Nov. 7	8	4	Gas Consolidation Ord. 'B' ...	19/—21/—	...
250,000	,,	4	4	Do. 4 p.c. Red. Cum. Pref.	17/6—19/6	...
19,189,963	Feb. 6	5⅔	5⅔	Gas Light & Coke Ord. ...	20/9—21/9a	...
2,600,000	,,	3½	3½	Do. 3½ p.c. max. ...	72—77	...
4,477,106	,,	4	4	Do. 4 p.c. Con. Pref. ...	92—97	...
2,993,000	Jan. 9	3⅔	3⅔	Do. 3⅔ p.c. Red. Pref. ...	93—98	...
8,602,497	Nov. 21	3	3	Do. 3 p.c. Con. Deb. ...	72—77	...
3,642,770	,,	5	5	Do. 5 p.c. Red. Deb. ...	108—112	...
3,500,000	,,	4⅔	4⅔	Do. 4⅔ p.c. Red. Deb. ...	105—109	—1
700,000	Sept. 5	3½	3½	Do. 3½ p.c. Red. Deb. ...	92—97	+2
270,466	Feb. 20	6	6	Harrogate New Cons. ...	115—120*	...
157,500	Mar. 21	1/2⅔	‡1/—	Hong Kong and China Ord. ...	⅞—1	...
213,200	Feb. 6	5⅔	6	Hornsey Con. 3½ p.c. ...	97—102	...
5,600,000	Oct. 24	12	8	Imperial Continental Cap. ...	117—122	...
172,810	Jan. 23	3½	3½	Do. 3½ p.c. Red. Deb. ...	88—93	—8
235,242	Aug. 8	8⅓	8⅓	Lea Bridge 5 p.c. Ord. ...	160—165	...
63,480	Dec. 19	3	3	Maidstone 3 p.c. Deb. ...	68—73	...
45,000	Nov. 21	†10	†10	Malta & Mediterranean ...	130—135	...
392,000	Oct. 3	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	100—105	...
231,977	Feb. 20	5	5	M.S. Utility 'C' Cons. ...	96—101*	...
968,658	,,	4	4	Do. 4 p.c. Cons. Pref. ...	91—96*	...
390,076	Dec. 19	4	4	M.S. Utility 4 p.c. Deb. ...	93—98	...
148,955	,,	5	5	Do. 5 p.c. Deb. ...	112—117	...
125,000	Jan. 3	3½	3½	Do. 3½ p.c. Red. Bds.	94—97	...
675,000	Nov. 21	†6	†6	Montevideo, Ltd.	70—75	...
250,000	Aug. 8	7½	7½	North Middlesex 6 p.c. Con.	142—147	...
396,160	Feb. 6	5	5	Northampton 5 p.c. max. ...	105—110	...
300,000	Oct. 24	†7	†9	Oriental, Ltd.	145—150	...
468,537	Dec. 5	8	7⅔	Plymouth & Stonehouse 5 p.c.	130—140	...
621,667	Feb. 20	8⅓	8⅓	Portsmouth & Gosport Cons.	154—159*	...
241,446	,,	5	5	Do. 5 p.c. max. ...	98—103*	...
73,350	,,	5	5	Do. 5 p.c. Pref. ...	105—110*	...
75,000	,,	4	4	Do. 4 p.c. Pref. ...	88—93*	...
114,000	Feb. 6	5	5	Preston 5 p.c. Pref.	105—110	...
247,966	Dec. 19	4	4	Primitiva 4 p.c. Cons. Deb. ...	96—101	...
625,959	Jan. 9	4	4	Do. 4 p.c. Red. Deb. ...	94—99	...
15,000	Sept. 5	6	6	San Paulo 6 p.c. Cum. Pref. ...	8½—9	...
441,275	Sept. 19	1/1½	1/1½	Severn Val. Gas Cor. Ld. Ord.	20/6—22/6	...
460,810	Sept. 19	—/10½	—/10½	,, ,, 4½ p.c. Cum. Pref.	19/6—21/6	...
133,201	Aug. 22	5	8⅓	Shrewsbury 5 p.c. Ord. ...	143—148	...
9,000	June 3	4	‡4	South African Ord.	4½—5½	...
1,371,752	Aug. 22	1/2⅔	1/2⅔	South East'n Gas Cn. Ld. Ord.	21/6—23/6	...
871 636	,,	—/10½	—/10½	Do. 4½ p.c. Red. Cum. Pref.	19/—21/—	...
498,818	,,	4	4	Do. 4 p.c. Cum. Pref. ...	17/—19/—	...
450,000	Feb. 6	4	4	Do. 4 p.c. Deb.	96—101	...
150,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	93—98	...
6,709,895	Feb. 6	5	6	South Met. Ord.	97—101	—1
1,135,812	,,	6	6	Do. 6 p.c. Irred. Pref. ...	125—130	...
850,000	,,	4	4	Do. 4 p.c. Irred. Pref. ...	92—97*	...
1,895,445	Dec. 19	3	3	Do. 3 p.c. Deb.	72—77	...
1,000,000	Jan. 9	5	5	Do. 5 p.c. Red. Deb. ...	107—110	...
600,000	,,	§31/—	3⅔	Do. 3⅔ p.c. Red. Deb. ...	98—101	...
1,543,795	Jan. 23	6	6	South Suburban Ord. 5 p.c. ...	110—115	...
512,825	,,	5	5	Do. 5 p.c. Pref.	105—110	...
500,000	,,	4	4	Do. 4 p.c. Pref.	92—97	...
250,000	,,	3⅔	3⅔	Do. 3⅔ p.c. Red. Pref. ...	91—96	...
888,587	Dec. 5	5	5	Do. 5 p.c. Deb.	111—116	...
250,000	,,	4	4	Do. 4 p.c. Deb.	93—98	...
200,000	Feb. 6	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
427,859	Sept. 19	8⅔	9⅔	S. Western Gas & Water Ord.	16/—18/—	...
160,523	Oct. 10	—/10½	—/10½	Do. 4½ p.c. Red. Cum. Pf.	19/—21/—	...
110,000	Dec. 19	4	4	Do. 4 p.c. Red. Deb. ...	93—98	...
750,541	Feb. 6	5	5½	Southampton Ord. 5 p.c. ...	104—109	...
148,836	Dec. 19	4	4	Do. 4 p.c. Deb.	93—98	...
350,000	Feb. 6	5½	5½	Swansea 5½ p.c. Red. Pref. ...	105—110	...
200,000	Dec. 19	3½	3½	Do. 3½ p.c. Red. Deb. ...	92—97	...
1,076,490	Feb. 20	6⅔	6⅔	Tottenham and District Ord.	123—128*	...
409,835	,,	5½	5½	Do. 5½ p.c. Pref.	114—119*	...
62,235	,,	5	5	Do. 5 p.c. Pref.	105—110*	...
334,615	Dec. 5	4	4	Do. 4 p.c. Deb.	93—98	...
85,701	Jan. 9	6	6	Tuscan 6 p.c. Red. Deb. ...	95—100	...
1,131,550	Aug. 22	6	4	U. Kingdom Gas Cor. Ord. ...	18/—19/—	...
1,051,280	Nov. 7	4⅔	4⅔	Do. 4⅔ p.c. 1st Cum. Pref.	19/—21/—	...
762,241	,,	4	4	Do. 4 p.c. 1st Red. Cum. Pf.	19/—21/—	...
745,263	Dec. 19	4⅔	4⅔	Do. 4⅔ p.c. 2nd Non-Cum. Pf.	15/6—17/6	...
1,066,186	Sept. 5	3½	3½	Do. 3½ p.c. Red. Deb. ...	96—99	...
375,689	Aug. 8	7	7	Uxbridge, &c., 5 p.c. ...	125—130	...
133,010	,,	5	5	Do. 5 p.c. Pref. ...	105—110	...
1,371,138	Jan. 23	7	7	Wandsworth Consolidated ...	122—127	...
2,525,768	,,	4	4	Do. 4 p.c. Pref.	90—95	...
1,343,964	Dec. 19	5	5	Do. 5 p.c. Deb. ...	111—116	...
383,745	,,	4	4	Do. 4 p.c. Deb. ...	93—98	...
400,000	,,	§25/—	3⅔	Do. 3⅔ p.c. Red. Deb. ...	96—101	...
558,342	Feb. 6	6⅔	6⅔	Watford and St. Albans Ord.	127—132	...
200,000	,,	5	5	Do. 5 p.c. Pref. ...	105—110	...
200,000	,,	5⅔	5⅔	Do. 5⅔ p.c. Pref. ...	112—117*	...
200,000	,,	§16/8	4	Do. 4 p.c. Red. Pref. ...	95—100	...
200,000	Dec. 19	4	4	Do. 4 p.c. Red. Deb. ...	93—98	...
200,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	92—97	...

a.—The quotation is per £1 of stock. * Ex. div. † Paid free of income-tax. ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Cont.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Nominal Quotations March 3.	Rise or Fall on Week.
202,152	Sept. 5	5	5	Ascot Ord.	101—106	...
128,182	Dec. 19	5	5	Do. 5 p.c. Pref.	107—112	...
31,035	Aug. 22	–/4½	–/4½	Associated Utilities 4 p.c. Pref.	16/—18/–	...
100,000	Dec. 19	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...
17,000	Feb. 20	8	8	Bognor Orig. Ord. 'A' ...	152—162*	...
62,210	,,	8	8	Do. New Addl. 'A' ...	152—162*	...
87,160	,,	7	7	Do. New 7 p.c. max. ...	142—152*	...
37,440	Feb. 6	10	10	Cam. Univ. & Town 10 p.c. max.	183—193	...
125,970	,,	7	7	Do. 7 p.c. max.	131—136	...
39,025	,,	5	5	Do. 5 p.c. max.	95—100	...
96,410	Feb. 6	4½	4½	Cardiff 4½ p.c. Pref.	93—98	...
150,000	Feb. 20	4	4	Croydon 4 p.c. Pref.	91—96*	...
130 000	Dec. 19	4	4	Do. 4 p.c. Deb.	93—98	...
65,000	Feb. 20	8½	7½	Eastbourne 'A' 5 p.c. ...	140—145	...
198,000	,,	7	6	Do. 'B' 3½ p.c.	113—118	...
112,312	,,	5	5	Do. 5 p.c. Pref.	107—112	...
130,000	Dec. 19	5	5	Do. 5 p.c. Deb.	110—115	...
24,000	Feb. 20	8½	8½	Great Yarmouth 8½ p.c. max.	40—45*	...
59,400	,,	7½	7½	Do. 7½ p.c. max.	30—35*	...
51,160	Dec. 5	5½	5½	Do. 5½ p.c. Deb.	117—122	...
152,600	Feb. 20	8	9	Guildford Cons.	160—165*	...
54,055	,,	5	5	Do. 5 p.c. Pref.	103—108*	...
68,250	Dec. 19	5	5	Do. 5 p.c. Deb.	109—114	+1
156,600	Feb. 20	7½	7½	Hampton Court Cons. ...	123—128*	...
80,000	Aug. 8	4	4	Lea Bridge 4 p.c. Pref. ...	90—95	...
60,000	,,	6	6	Do. 6 p.c. Pref.	121—126	...
94,876	Dec. 5	4	4	Do. 4 p.c. Deb.	92—97	...
73,620	Sept. 5	8½	8½	Luton Cons. 'A'	153—163	...
107,960	Sept. 19	5½	4	Mid Kent Ord.	8½—9½	...
230,940	Feb. 6	10	10	Oxford & District Ord. ...	192—197	...
47,112	,,	5	5	Do. 5 p.c. Pref.	104—109	...
50,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	108—113	...
126,193	Nov. 7	7½	7½	Peterborough Ord.	137—142	...
64,990	Sept. 5	6½	7½	Redditch Ord....	118—128	...
166,850	Feb. 6	8	8	Romford Ord....	142—147	...
60,000	,,	4	4	Do. 4 p.c. Pref.	97—102	...
44,000	Sept. 19	5	5	Do. 5 p.c. Deb.	110—115	...
25,570	Feb. 6	5½	5½	Rugby 5½ p.c. Pref.	118—123	...
25,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	103—108	...
42,750	Dec. 5	5½	5½	Do. 5½ p.c. Deb.	117—122	...
110,950	Feb. 20	8	8	Ryde Ord.	137—147*	...
270,086	Sept. 5	7	7	Slough Ord..	128—133	...
21,000	Dec. 19	5	5	Do. 5 p.c. Deb.	107—112	...
28,872	Nov. 7	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	17/—19/–	...
28,866	Sept. 5	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	17/—19/–	...
117,228	Feb. 20	5	7	Swindon Cons.	100—105*	...
60,425	Dec. 5	5	5	Do. 5 p.c. Deb.	108—113	...
64,380	Dec. 19	5	5	Torquay & Paignton 5 p.c. Pref.	105—110	...
130,000	Feb. 6	5	8	Wakefield Ord.	116—121	...
81,650	,,	5	5	Do. 5 p.c. max.	92—97	...
82,000	Jan. 23	6	6	Weymouth Ord.	101—106	...
98,384	Feb. 6	6	6	Wolverhampton 6 p.c. Pref.	117—122	...
160,000	Dec. 19	5½	5½	Do. 5½ p.c. Rd. Db.	103—108	...
90,000	Dec. 19	5	5	York 5 p.c. Red. Deb. ...	102—107	...
133,640	Feb. 20	6½	6½	Yorktown (Cam.) 5 p.c. Cons.	115—120*	...
120,000	,,	5	5	Do. 5 p.c. Pref.	103—108*	...
35,000	Dec. 5	5½	5½	Do. 5½ p.c. Deb.	115—120	...

BRISTOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations March 3.	Rise or Fall on Week.
347,756	Feb. 6	5	6	Bath Cons.	115—117	...
1,667,250	Feb. 6	5	5	Bristol, 5 p.c. max. ...	109½—111½	...
120,420	Dec. 19	4	4	Do. 1st 4 p.c. Deb. ...	98—101	...
217,870	,,	4	4	Do. 2nd 4 p.c. Deb. ...	98—101	...
328,790	,,	5	5	Do. 5 p.c. Deb.	115—118	–2
274,000	Feb. 20	5	5	Newport (Mon.) 5 p.c. max. ...	95—98*	...
13,200	Sept. 19	8½	7	Pontyp'l Gas & W. 10 p.c. 'A'	12½—13½	...
13,600	,,	6	5	Do. 7 p.c. 'B' ...	11½—12½	...
40,000	,,	6	5	Do. 7 p.c. 'C' ...	11½—12½	...
140,778	Feb. 6	5	5	Weston-super-Mare Cons. ...	104—106	...
64,338	Dec. 19	4	4	Do. 4 p.c. Deb. ...	98—101	...
33,340	,,	7½	7½	Do. 7½ p.c. Deb. ...	149—152	...

LIVERPOOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations March 3.	Rise or Fall on Week.
157,150	Feb. 6	5	6½	Chester 5 p.c. Ord.	107—110	...
92,500	Dec. 19	4	4	Do. 4 p.c. Pref.	95—99	...
36,430	,,	3½	3½	Do. 3½ p.c. Deb.	87—90	...
41,890	,,	4	4	Do. 4 p.c. Red. Deb. ...	97—101	...
2,167,410	Feb. 20	6	6	Liverpool 5 p.c. Ord.... ...	120—122*	...
245,500	Dec. 19	5	5	Do. 5 p.c. Red. Pref. ...	100—105	...
306,083	Jan. 23	4	4	Do. 4 p.c. Deb.... ...	100—102	...
106,280	Feb. 6	10	10	Preston 'A' 10 p.c. ...	177—187	...
188,219	,,	7	7	Do. 'B' 7 p.c.	129—139	...

NEWCASTLE EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations March 3.	Rise or Fall on Week.
122,577	Feb. 20	8	8	Blyth 5 p.c. Ord.	157½—158½*	...
732,000	Feb. 20	3	3	Hartlepool G. & W. Cn. & New	67½—68½*	...
2,061,315	Feb. 6	5	5½	Newcastle & Gateshead Con.	22/6–23/3a	+–/1½
682,856	,,	4	4	Do. 4 p.c. Pref. ...	98½—99½*	...
776,706	Dec. 19	3½	3½	Do. 3½ p.c. Deb. ...	88—89	...
277,285	Oct. 24	5	5	Do. 5 p.c. Deb. '43 ...	103½—105½	...
332,351	Feb. 6	6	6	Sunderland 6 p.c. max. ...	132½—134½	...

NOTTINGHAM EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations March 3.	Rise or Fall on Week.
542,270	Feb. 6	6	9	Derby Con.	132—137	...
55,000	Dec. 19	4	4	Do. 4 p.c. Deb.	100—105	...
20,000	Dec. 19	5	5	Long Eaton 5 p.c. Pref. ...	10—12	...
80,000	,,	5	5	Do. 5 p.c. Deb. ...	105—110	...

SHEFFIELD EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations March 3.	Rise or Fall on Week.
10,000	Feb. 6	10	10	Great Grimsby 'A' Ord. ...	205—215	...
6,500	,,	10	10	Do. 'B' Ord. ...	205—215	...
79,000	,,	10	10	Do. 'C' Ord. ...	195—205	...
1,806,339	Feb. 20	6½	6½	Sheffield Cons.	135½—137½	...
95,000	Dec. 19	4	4	Do. 4 p.c. Deb.	100—102	...

a The quotation is per £1 of Stock.
* Ex div.

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